

June 2023

CS400 Series Commercial / Industrial Pressure Reducing Regulators

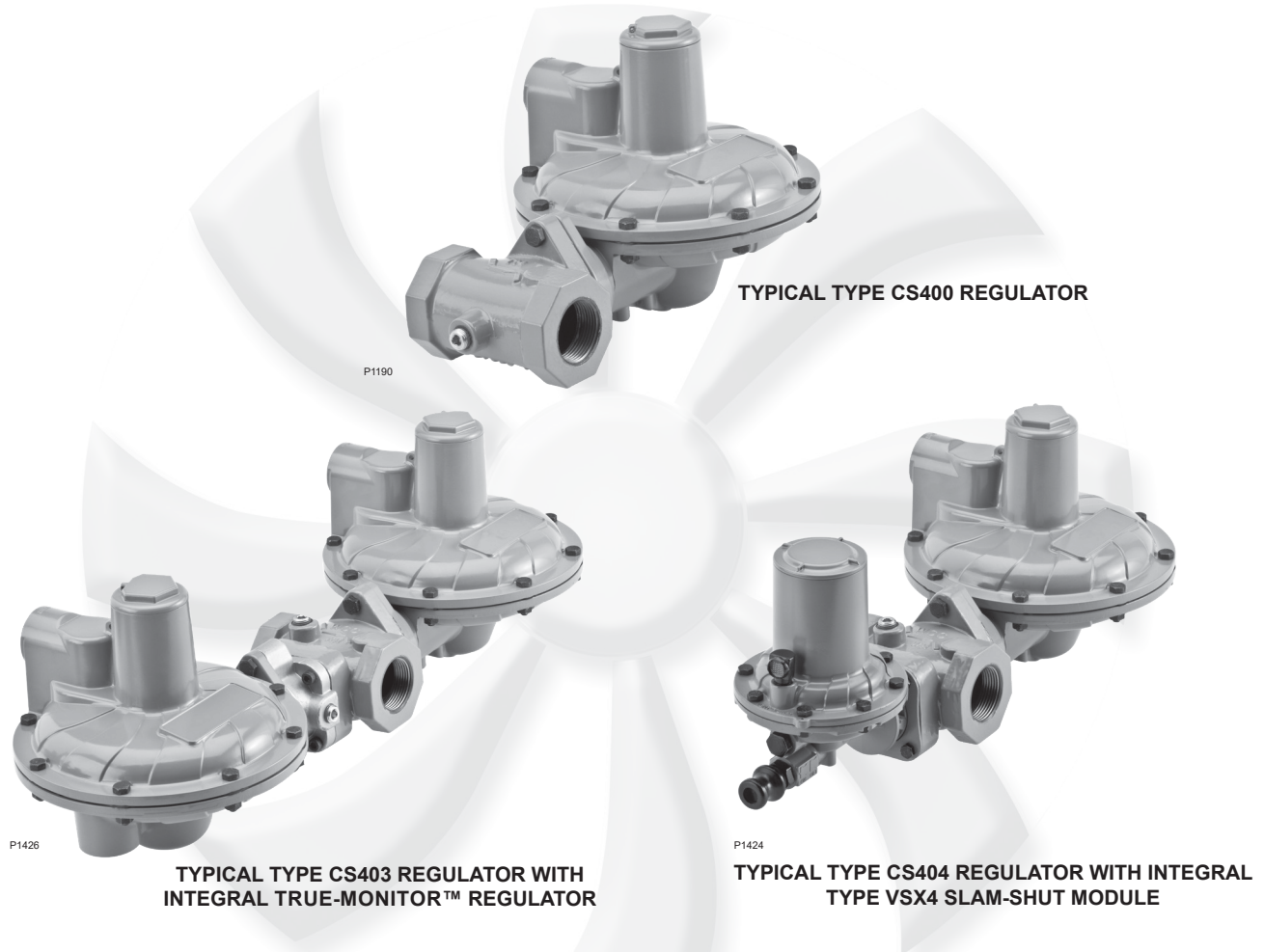


Figure 1. Typical Type CS400 Pressure Reducing Regulator

Features and Benefits

- Wide Variety of Body Sizes and End Connections
- Fixed Factor/PFM Accuracy Capabilities
- Field Convertible from Internal Sensing to External Sensing for Wide-Open Monitor Construction
- Available in Gray Cast Iron, Ductile Iron and Steel Body Materials
- Only Standard Tools Required for Pressure Adjustment and Orifice Removal
- Easy to Maintain
- Up to 25% Hydrogen Blend (By Volume)
- 100% Hydrogen Construction Available (Contact Factory)

CS400 Series

Specifications

The Specifications section lists the specifications for the CS400 Series Regulators. The following information is stamped on the nameplate of CS400 Series: Type and Class, Maximum Outlet Pressure and Spring Range.

Available Configurations

See Figure 3

Body Sizes, Material, End Connections and Pressure Rating⁽¹⁾

See Table 1

Inlet Pressures⁽¹⁾

Emergency: 175 psig / 12.1 bar

Operating: See Table 2

Maximum Outlet Pressure⁽¹⁾

Casing: 25 psig / 1.7 bar

To Avoid Internal Parts Damage: 5 psig / 0.34 bar over set pressure

Operating: 5.5 psig / 380 mbar

Outlet Pressure Ranges⁽¹⁾

3.5 in. w.c. to 5.5 psig / 9 to 380 mbar

Internal Relief Performance

Approximate Internal Relief Start-to-Discharge:

See Table 4

Relief Performance: See Figures 10 to 14 and Tables 10, 13, 18, 23 and 28

Token Relief

$C_g = 67$

Flow Capacities

Type CS400;

See Tables 9, 11, 12, 14, 15, 16, 17, 19, 20, 21, 22, 24, 25, 26, 27, 29 through 43

Types CS403 and CS404;

See Tables 44 through 69

Type CS400 for Pressure Factor Measurement (PFM) Applications:

See Tables 70 and 71

Flow and IEC Sizing Coefficients

See Table 2

Orifice Sizes

See Table 2

Operating Temperature (TS)⁽¹⁾⁽²⁾

According to PED Standards:

All Types: -4 to 150°F / -20 to 66°C

Non-PED:

All Types: -20 to 150°F / -29 to 66°C

Spring Case Vent Connection

1 NPT

Spring Case Vent and Body Orientation

See Figures 15 and 16

External Registration Connection

3/4 NPT

Inlet Pressure Tap

1/4 NPT restricted to 0.054 in. / 1.37 mm

TM600 Series True-Monitor™ Performance⁽¹⁾

Inlet Pressure Ratings

Maximum Operating: Up to 125 psig / 8.6 bar

Maximum Emergency: 175 psig / 12.1 bar

Outlet Pressure Range:

11 in. w.c. to 7.5 psig / 27 mbar to 0.52 bar

Type VSX4 Slam-Shut Device

Maximum Inlet Pressure: 290 psig / 20.0 bar

Maximum Operating Inlet Pressure:

232 psig / 16.0 bar

Construction Materials

CS400 Series Main Valve and Actuator

Body: Gray Cast Iron, Ductile Iron and Steel

Body O-ring: Nitrile (NBR)

Closing Cap: Aluminum

Adjusting Screw: Aluminum

Diaphragm Case and Spring Case: Aluminum

Diaphragm Plate: Zinc-plated steel

Valve Stem: Aluminum

Orifice: Aluminum

Pusher Post: Aluminum

Diaphragm and Disk: Nitrile (NBR)

Control Spring: Music Wire or Stainless steel

Relief Valve Spring: Stainless steel

Relief Valve Spring Retainer: Aluminum

Vent Screen: Stainless steel

Vent Retaining Ring: Zinc-plated steel

Lever Pin: Stainless steel

Spring Seat, Lever, Other Metal Parts: Steel

Type TM600 True-Monitor Actuator

Diaphragm Case, Spring Case, Disk Housing,

Diaphragm Upper Retainer and

Valve Stem: Aluminum

Diaphragm Head: Zinc-plated steel

Diaphragm: Nitrile (NBR)

Disk holder and Disk Retainer: Brass

Disk/Seat Contact: Nitrile (NBR)

1. The pressure/temperature limits in this Bulletin or any applicable standard limitation should not be exceeded.

2. Product has passed Fisher™ testing for lockup, relief start-to-discharge and reseal down to -40°F / -40°C.

- continued -

Specifications (continued)

Type TM600 True-Monitor™ Actuator (continued)

Monitor Stem: Stainless
Middle Diaphragm Retainer: Zinc-plated steel
Control Spring: Music wire or Stainless steel
Vent Screen: Stainless steel
Vent Retaining Ring: Zinc-plated steel
Closing Cap: Aluminum
Adjusting Screw: Aluminum
O-rings: Nitrile (NBR)

Type VSX4 Slam-shut Device

Diaphragm Case and Spring Case: Aluminum
Diaphragm Plate: Engineered Resin
Diaphragm and Disk: Nitrile (NBR)
Control Spring: Music Wire, Stainless steel or Steel
Vent Screen: Stainless steel
Closing Cap: Aluminum
Adjusting Screw: Brass

Approximate Weights

With Threaded Body

Type CS400: 9 lbs / 4 kg
Type CS403: 18.5 lbs / 8 kg
Type CS404: 11.2 lbs / 5 kg

With Flanged Body

Add 8.6 lbs / 4 kg to weights listed

Designed, Tested and Evaluated Consistent With:

ASME B16, ASME Section VIII DIV I, ASTM B117
 (Corrosion Resistance and EN334)

Hydrogen

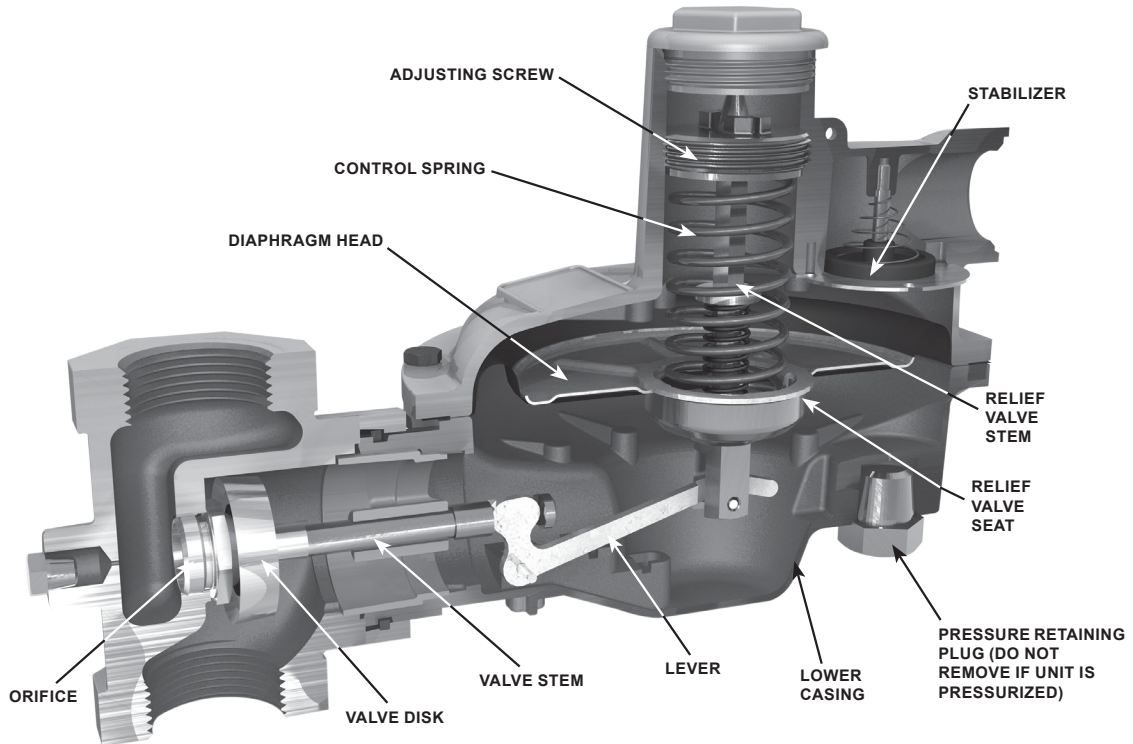
- Up to 25% Hydrogen Blend (By Volume)
- 100% Hydrogen Construction Available (Contact Factory)

TYPE NUMBER					OPTIONS	
C	S	4	0			
						OVERPRESSURE PROTECTION MODULE
				0		Without Overpressure Protection Module
				3		With Integral Monitor Module ⁽¹⁾⁽²⁾
				4		With Slam-shut Module ⁽³⁾
						PRESSURE REGISTRATION
				E		External Registration ⁽³⁾
				I		Internal Registration
						RELIEF
				N		Non-Relief
				T		Token Internal Relief
				R		Internal Relief
Example: Type number CS404IT : A Type CS400 regulator constructed with Type VSX4 Slam-shut module, with Internal pressure registration and with Token relief.						
1. Reference Instruction Manual D103126X012 for information regarding the Integral Monitor module. 2. Reference Instruction Manual D103127X012 for information regarding the Type VSX4 safety shut-off module. 3. Available only with Non-Relieving or Token Relief options, not Internal Relief.						

Figure 2. Available Configurations

Table 1. Body Sizes, Materials, End Connections and Pressure Rating

BODY MATERIAL	INLET SIZE	OUTLET SIZE	END CONNECTION	FACE-TO-FACE DIMENSION		BODY PRESSURE RATING	
				In.	mm	psig	bar
Gray Cast Iron	1-1/4	1-1/4	NPT	4.5	114	175	12.1
	1-1/4	1-1/2					
	1-1/2	1-1/2					
	2	2	CL125 FF	10	254		
Ductile Cast Iron	1-1/4	1-1/4	NPT	4.5	114	290	20.0
	1-1/2	1-1/2					
	2	2					
	1-1/4	1-1/4	Rp	4.5	114	290	20.0
	1-1/2	1-1/2					
	2	2					
	NPS 2 / DN 50	NPS 2 / DN 50	CL125 FF/CL150 FF	10	254	232	16.0
PN 10/16			10	254			
Steel	1-1/4	1-1/4	NPT	4.5	114	290	20.0
	1-1/2	1-1/2					
	1-1/4	1-1/4	Rp	4.5	114	290	20.0
	1-1/2	1-1/2					



P1003

Figure 3. Typical Type CS400 Internal View

Introduction

The CS400 Series direct-operated, spring-loaded regulators have been engineered to fit a multitude of pressure-reducing applications including commercial and industrial installations. This flexibility is provided by the numerous body sizes and end connections, outlet pressure settings, orifice sizes, as well as the option for internal or external pressure registration.

In addition to application flexibility, the CS400 Series offers multiple overpressure protection options to meet your demands on application requirements.

Features

Hydrogen Applications

The CS400 Series family has been evaluated for material compatibility, potential leakage and permeation and susceptibility to embrittlement for blending applications. Based on an extensive evaluation and testing program, the CS400 Series and all configurations are available for use in Hydrogen applications. Contact the factory for 100% Hydrogen applications.

Overpressure Protection Options Available:

- **Internal Relief** – Relieves gas across the main diaphragm assembly to minimize downstream pressure buildup.
- **True-Monitor™ Protection** – Combines the operation of a conventional two-regulator wide-open monitor set into one body. Provides a second monitoring regulator to control downstream pressure. In event of loss of downstream pressure control by the primary regulator due to damage to the lever, downstream sense line, orifice, disk, diaphragm, etc., the monitoring regulator will assume control of the downstream pressure and regulator flow.
- **Slam-Shut Protection** – Discontinues gas service by shutting the gas off if there is an overpressure or underpressure condition.
- **Token Relief** – Provides a small capacity or token relief that relieves minor overpressure caused by thermal expansion or minor nicks in the orifice or disk.

Table 2. Inlet Pressure Ratings and Flow and Sizing Coefficients

TYPE	ORIFICE SIZE		MAXIMUM OPERATING INLET PRESSURE TO OBTAIN OPTIMUM PERFORMANCE		FLOW COEFFICIENTS (WIDE-OPEN)		C ₁	IEC SIZING COEFFICIENTS		
	In.	mm	psig	bar	C _g	C _v		X _T	F _L	F _D
CS400, CS403 and CS404	3/16	4.8	125	8.6	27	0.97	27.7	0.50	0.89	0.91
	7/32 x 1/4 ⁽¹⁾	5.5 x 6.4 ⁽¹⁾	125	8.6	36.5	1.26	28.9	0.53		0.89
	1/4	6.4	125	8.6	50	1.77	28.2	0.50		0.92
	5/16	7.9	100	6.9	82	2.90	28.3	0.50		0.94
	3/8 ⁽²⁾	9.5 ⁽²⁾	60	4.1	113	3.72	30.4	0.58		0.89
	1/2	12	40	2.8	182	5.61	32.4	0.66		0.82
	5/8	16	30	2.1	284	7.26	39.1	0.97		0.74
	3/4	19	20	1.4	356	9.83	36.2	0.83		0.72

1. Available for Type CS400 only.
2. 80 psig / 5.5 bar maximum operating inlet pressure available at special request for setpoints 1 psig / 0.07 bar or greater.

Table 3. Outlet Pressure Ranges

TYPE	OUTLET PRESSURE RANGE		PART NUMBER	SPRING COLOR	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
	In.	mm			In.	mm		
CS400, CS403 and CS404	3.5 to 5 in. w.c.	9 to 12 mbar	GE30198X012	Red	0.098	2.49	4.18	106
	4.5 to 6.5 in. w.c.	11 to 16 mbar	GE30195X012	Purple	0.080	2.03	4.32	110
	6 to 8 in. w.c.	15 to 20 mbar	GE30188X012	Gold	0.108	2.74	4.18	106
	7.5 to 11 in. w.c.	19 to 27 mbar	GE30189X012	Blue	0.110	2.80	4.40	112
	10 to 14 in. w.c.	25 to 35 mbar	GE30224X012	Unpainted				
	12 to 19 in. w.c.	30 to 47 mbar	GE30196X012	Green	0.112	2.85	4.70	119
	18 in. w.c. to 1 psig	45 to 69 mbar	GE30225X012	Orange	0.120	3.05	4.94	125
	1 to 2 psig	69 to 138 mbar	GE30190X012	Black	0.140	3.56	4.66	118
2 to 5.5 psig	138 to 380 mbar	GE30197X012	Yellow	0.172	4.37	4.42	112	

Table 4. Approximate Internal Relief Valve Start-to-Discharge Pressure Above Setpoint

SETPPOINT	SPRING COLOR	SPRING PART NUMBER	START-TO-DISCHARGE PRESSURE RANGE ABOVE SETPOINT	
			Internal Relief	Token Relief
7 in. w.c. / 17 mbar	Gold	GE30188X012	6 to 12 in. w.c. / 15 to 30 mbar	6 to 12 in. w.c. / 15 to 30 mbar
11 in. w.c. / 27 mbar	Blue	GE30189X012	6 to 12 in. w.c. / 15 to 30 mbar	6 to 12 in. w.c. / 15 to 30 mbar
14 in. w.c. / 35 mbar	Unpainted	GE30224X012	6 to 12 in. w.c. / 15 to 30 mbar	6 to 12 in. w.c. / 15 to 30 mbar
1 psig / 69 mbar	Orange	GE30225X012	0.5 to 1.5 psi / 34 to 103 mbar	0.5 to 1 psi / 34 to 69 mbar
2 psig / 138 mbar	Black	GE30190X012	0.5 to 1.5 psi / 34 to 103 mbar	0.5 to 1 psi / 34 to 69 mbar
5 psig / 345 mbar	Yellow	GE30197X012	0.5 to 3.3 psi / 34 to 228 mbar	0.5 to 2 psi / 34 to 138 mbar

Table 5. Type CS403 Overpressure Protection Benefits Vs. Backup Orifice Device

	CS403 SERIES True-Monitor™	BACKUP ORIFICE DEVICE
Damage/nick on seat	X	X
Damage to disk	X	X
Damage or disconnected lever	X	----
Damage to diaphragm	X	----
Blocked or broken registration to primary regulator ⁽¹⁾	X	----

1. For external pressure registered units, in order to gain True-Monitor Protection in the case of damaged or broken sense line, it is required that the Primary and Integral Wide-Open Monitor do not share downstream sense lines.

CS400 Series

Table 6. Type CS403 Regulator and Integral Monitor Outlet Pressure Ranges

Type	PRIMARY REGULATOR				INTEGRAL MONITOR				
	Setpoint		Spring Part Number	Spring Color	Setpoint ⁽¹⁾		Spring Part Number	Spring Range, In. w.c. / mbar	Spring Color
	In. w.c.	mbar			In. w.c.	mbar			
CS403	4	10	GE30198X012	Red	14	35	GE30189X012	12 to 21 / 30 to 52	Blue
	5	12	GE30195X012	Purple					
	7	17	GE30188X012	Gold					
	11	27	GE30189X012	Blue	21	52	GE30196X012	18 to 30 / 45 to 75	Green
	14	35	GE30224X012	Unpainted					
	18	45	GE30196X012	Green	1 psig	69	GE30225X012	26 to 40 / 65 to 99	Orange
	1 psig	69	GE30225X012	Orange	1.5 psig	103	GE30190X012	1.4 to 2.9 psig / 97 to 200	Black
	2 psig	138	GE30190X012	Black	2.5 psig	172	GE30190X012	1.4 to 2.9 psig / 97 to 200	Black
	3 psig	207	GE30197X012	Yellow	3.5 psig	241	GE35081X012	2.6 to 3.7 psig / 179 to 255	Purple
	4 psig	276	GE30197X012		5 psig	345	GE30192X012	3.6 to 6 psig / 248 to 414	Dark Blue
5 psig	345	GE30197X012	6 psig		414	GE33121X012	5.1 to 7.5 psig / 352 to 517	Red	

1. Integral Monitor setpoints shown represent the minimum setpoint difference between the Integral Monitor and the Primary regulator. Higher monitor setpoints can be chosen, e.g., for a Primary regulator setpoint of 7 in. w.c. / 17 mbar, the Integral Monitor can also be set at 14, 21 in. w.c. / 35, 52 mbar, 1 psig / 69 mbar or higher.

Table 7. Type CS404 Regulator and Slam-Shut OPSO Pressure Ranges

Type	REGULATOR		SLAM-SHUT DEVICE		
	Setpoint, In. w.c. / mbar	Spring Range, In. w.c. / mbar	Overpressure Shutoff (OPSO)		
			Factory Setpoint, In. w.c. / mbar ⁽¹⁾	Spring Range, In. w.c. / mbar	Spring Part Number
CS404	4 / 10	3.5 to 5 / 9 to 12	18 / 45	12 to 25 / 30 to 60	GF02168X012
	5 / 12	4.5 to 6.5 / 11 to 16	19 / 47		
	7 / 17	6 to 8 / 15 to 20	21 / 52		
	11 / 27	7.5 to 11 / 19 to 27	0.9 psig / 62	0.58 to 1.6 psig / 40 to 110	GF02169X012
	14 / 35	10 to 14 / 25 to 35	1.1 psig / 75		
	0.65 psig / 45	0.45 to 0.7 psig / 30 to 47	1.4 psig / 96	0.87 to 2.8 psig / 60 to 190	GF02170X012
	0.72 psig / 50	0.65 to 1 psig / 45 to 69	1.6 psig / 112		
	1 psig / 69	1 to 2 psig / 69 to 138	2.5 psig / 172	1.4 to 4.1 psig / 95 to 280	GF02171X012
	1.5 psig / 103		3.0 psig / 207		
	2 psig / 138		3.5 psig / 241		
	3 psig / 207	2 to 5.5 psig / 138 to 380	6.3 psig / 434	3.2 to 11 psig / 220 to 760	GF02173X012
	4 psig / 276		7.3 psig / 503		
	5 psig / 345		8.3 psig / 572		
5.5 psig / 380	8.8 psig / 606				

1. For Types CS404IT and CS404ET equipped with Token Relief, if Non-Factory slam-shut OPSO setpoints are specified, they must not encroach on the Token Relief Start-to-Discharge values provided in Table 4.

Table 8. Type CS404 Regulator and Slam-shut OPSO and UPSO Pressure Ranges

Type	REGULATOR		SLAM-SHUT DEVICE					
	Setpoint, psig / mbar	Spring Range, psig / mbar	Overpressure Shutoff (OPSO)			Underpressure Shutoff (UPSO)		
			Typical Setpoint, psig / mbar ⁽¹⁾	Range, psig / mbar	Spring Part Number	Typical Setpoint, psig / mbar ⁽¹⁾	Range, psig / mbar	Spring Part Number
CS404	0.51 / 35	0.36 to 0.51 / 25 to 35	1.1 / 75	0.73 to 1.9 / 50 to 130	GF02168X012	0.32 / 22	0.14 to 1.1 / 10 to 75	T14169T0012
	0.65 / 45	0.45 to 0.7 / 30 to 48	1.4 / 95			0.4 / 30		
	0.72 / 50	0.65 to 1 / 45 to 69	1.6 / 110	1.4 to 3.9 / 95 to 270	GF02169X012	0.4 / 30		
	1 / 69		2.5 / 172	2.2 to 5.5 / 150 to 380	0.58 / 40	0.36 to 2.3 / 25 to 160	T14170T0012	
	1.5 / 103	1 to 2 psig / 69 to 138	3.0 / 207		0.73 / 50			
	2 / 138		3.5 / 241	GF02171X012	1 / 69	1.5 to 7.3 / 100 to 500	FA142869X12	
	3 / 207	2 to 5.5 psig / 138 to 380	6.3 / 434		1.75 / 121			
	4 / 276		7.3 / 503	2 / 140				
	5 / 345	8.3 / 572	5.8 to 16 / 400 to 1100	2.9 / 200				
	5.5 / 380	8.8 / 606		GF02172X012	3.6 / 250			

1. For Types CS404IT and CS404ET equipped with Token Relief, if Non-Factory slam-shut OPSO setpoints are specified, they must not encroach on the Token Relief Start-to-Discharge values provided in Table 4.

Principle of Operation

Type CS400 Base Regulator Operation

Refer to Figures 4 and 5. When downstream demand decreases, the pressure under the diaphragm increases. This pressure overcomes the regulator setting (which is set by the regulator control spring). Through the action of the pusher post assembly, lever and valve stem, the valve disk moves closer to the orifice and reduces gas flow. If demand downstream increases, pressure under the diaphragm decreases. Spring force pushes the pusher post assembly downward, the valve disk moves away from the orifice and the gas flow increases downstream as the regulator opens in response to the decreased pressure underneath the diaphragm.

The Type CS400IR regulator includes an internal relief valve for overpressure protection. If the downstream pressure exceeds the regulator setting by 7 to 28 in. w.c. / 17 to 69 mbar (depending on the main spring used), the relief valve opens and excess gas is vented through the stabilizer vent in the upper spring case.

The Types CS400IT and CS400ET provide a low capacity/token relief. Token relief provides relief from minor overpressure caused by nicks or dents on the orifice or by thermal expansion of gas in the downstream line. Token relief also provides a token or signal, in the form of odor, that an overpressure situation is occurring.

Type CS403 Integral Monitor Operation

Type CS403 combines the operation of a conventional two-regulator wide-open monitor set into one body, see Figures 6 and 7. The Integral True-Monitor™ is installed on the inlet side of the body and serves to throttle flow and maintain an acceptable downstream pressure in the case where the Primary regulator fails to regulate downstream pressure. During normal operation the Integral Monitor is in a wide-open state as its setpoint is set higher than the primary regulator. See Table 6 for guidance regarding the setpoints of the regulator and associated integral monitor sets. If the downstream pressure should rise to the setpoint of the internal monitor due to loss of pressure control by the primary regulator, the integral monitor will assume

control and regulator the flow to the downstream system. See the Type TM600 Instruction Manual for additional details of operation.

If a Token relief is present, the token relief will relieve a small amount of gas to the atmosphere as an indication that the Integral monitor is controlling the downstream pressure.

Type CS404 Slam-Shut Operation

The Type VSX4 slam-shut module on the Type CS404 regulator is a fast acting shut-off device that provides overpressure (OPSO) or over and underpressure (OPSO/UPSO) protection by completely shutting off the flow of gas to the downstream system. See Tables 7 and 8 for guidance regarding the typical setpoints of the regulator and associated OPSO and UPSO sets. The Type VSX4's actions are independent of the Type CS404 regulator and of variations to the inlet pressure. The Type VSX4 provides the option of internal or external downstream pressure registration. External registration requires a downstream sensing line.

The Type VSX4 shut-off disk is normally in the open (reset) position, see Figures 8 and 9. If the downstream pressure below the slam-shut diaphragm increases (or decreases) until it reaches the slam-shut setpoint, this diaphragm moves upward (or downward) to release the trip mechanism which allows the spring force on the stem to push the disk against the seat, shutting off all gas flow. To reset the slam-shut after gas has been shutoff, reference the Type VSX4 Instruction Manual for additional details.

In order for the Underpressure Shutoff (UPSO) of any slam-shut to be triggered, the downstream pipe pressure must drop below the UPSO setpoint. In the case of a downstream line break, numerous factors can prevent the downstream pipe pressure from decreasing below the slam-shut UPSO setpoint. These factors include the distance of pipe to the break, the diameter of the pipe, size of the break and the number of restrictions, such as valves, elbows and bends, downstream of the regulator and/or slam-shut device. Due to these factors additional protections should be installed to stop flow in the event of a line break.

CS400 Series

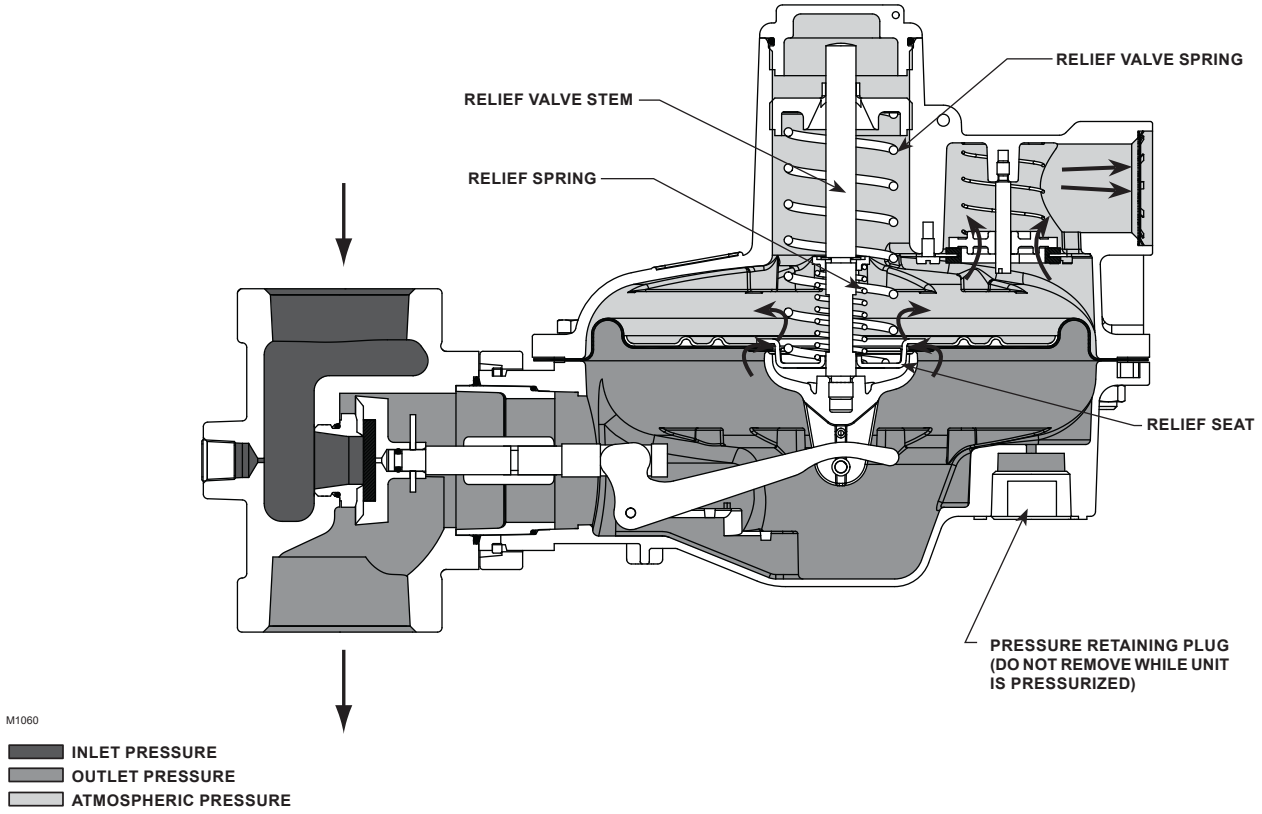


Figure 4. Type CS400IR Internally Registered Regulator with Internal Relief Operational Schematic

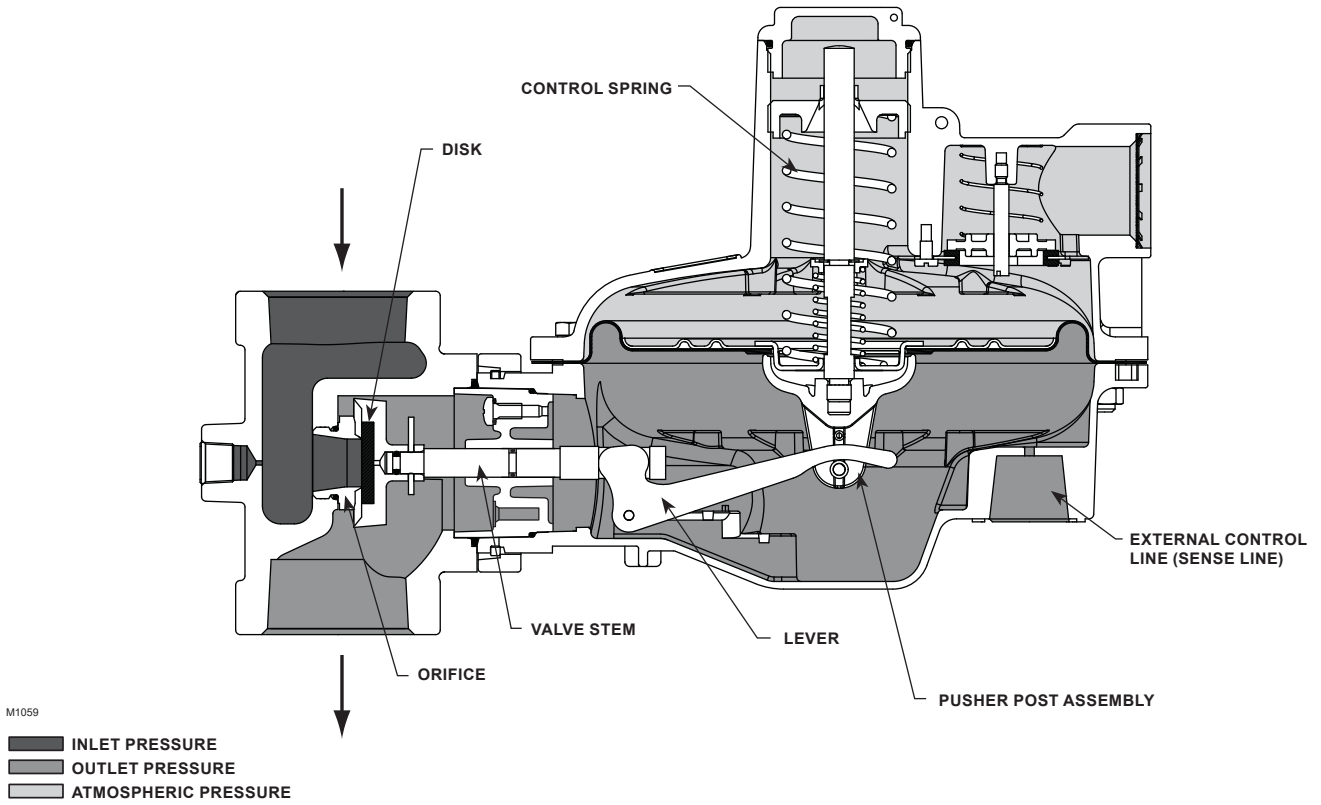
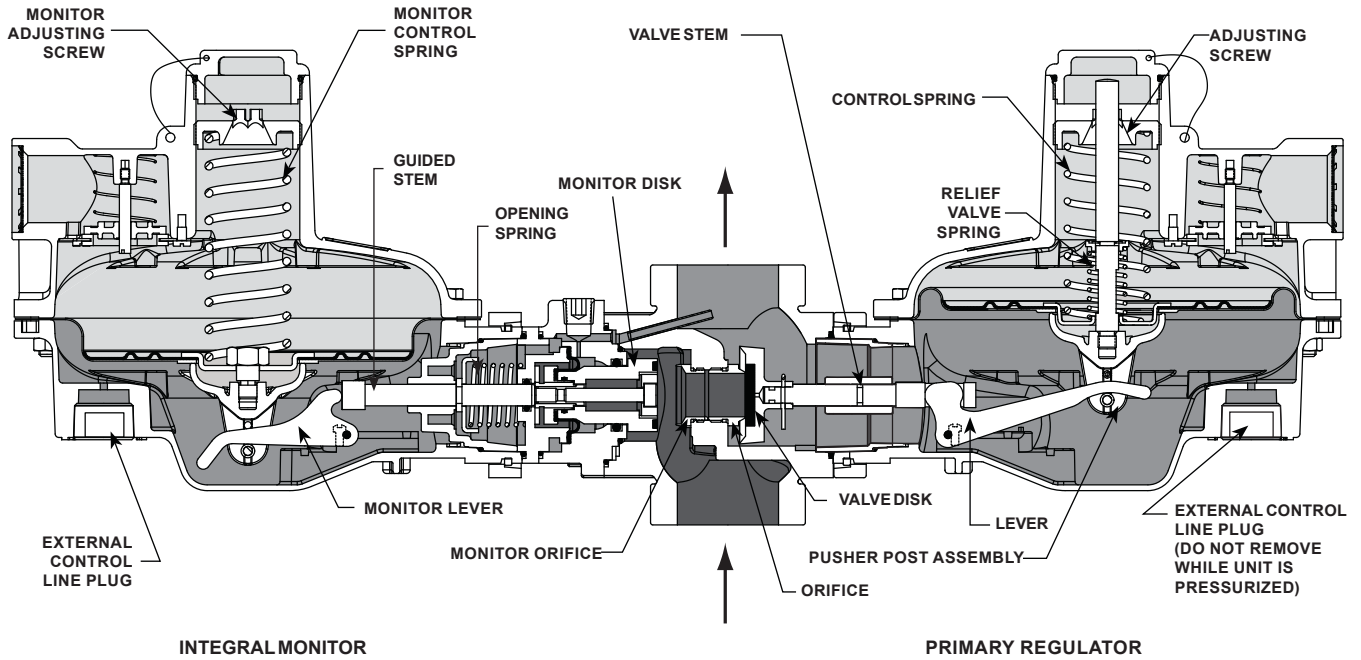


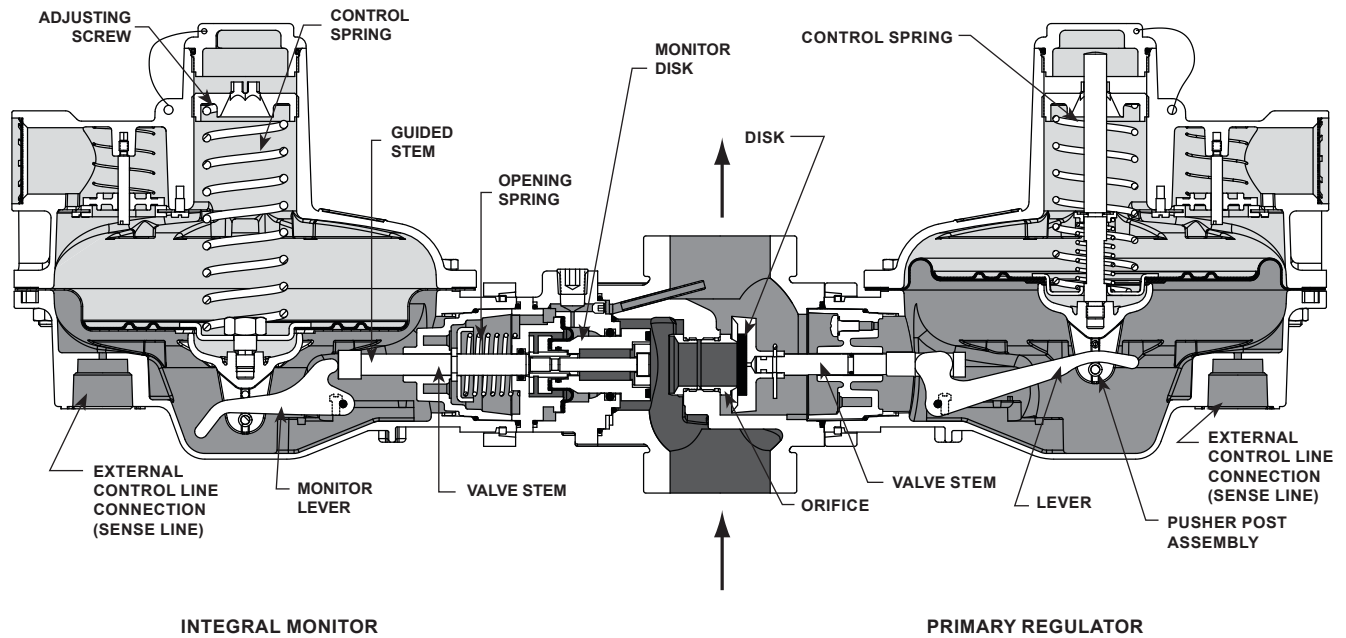
Figure 5. Type CS400ER Externally Registered Regulator Operational Schematic



M1061

- INLET PRESSURE
- OUTLET PRESSURE
- ATMOSPHERIC PRESSURE

Figure 6. Type CS403, Internally Registered Primary Regulator with Internally Registered Integral Monitor Operational Schematic



M1062

- INLET PRESSURE
- OUTLET PRESSURE
- ATMOSPHERIC PRESSURE

Figure 7. Type CS403, Externally Registered Primary Regulator with Externally Registered Integral Monitor Operational Schematic

CS400 Series

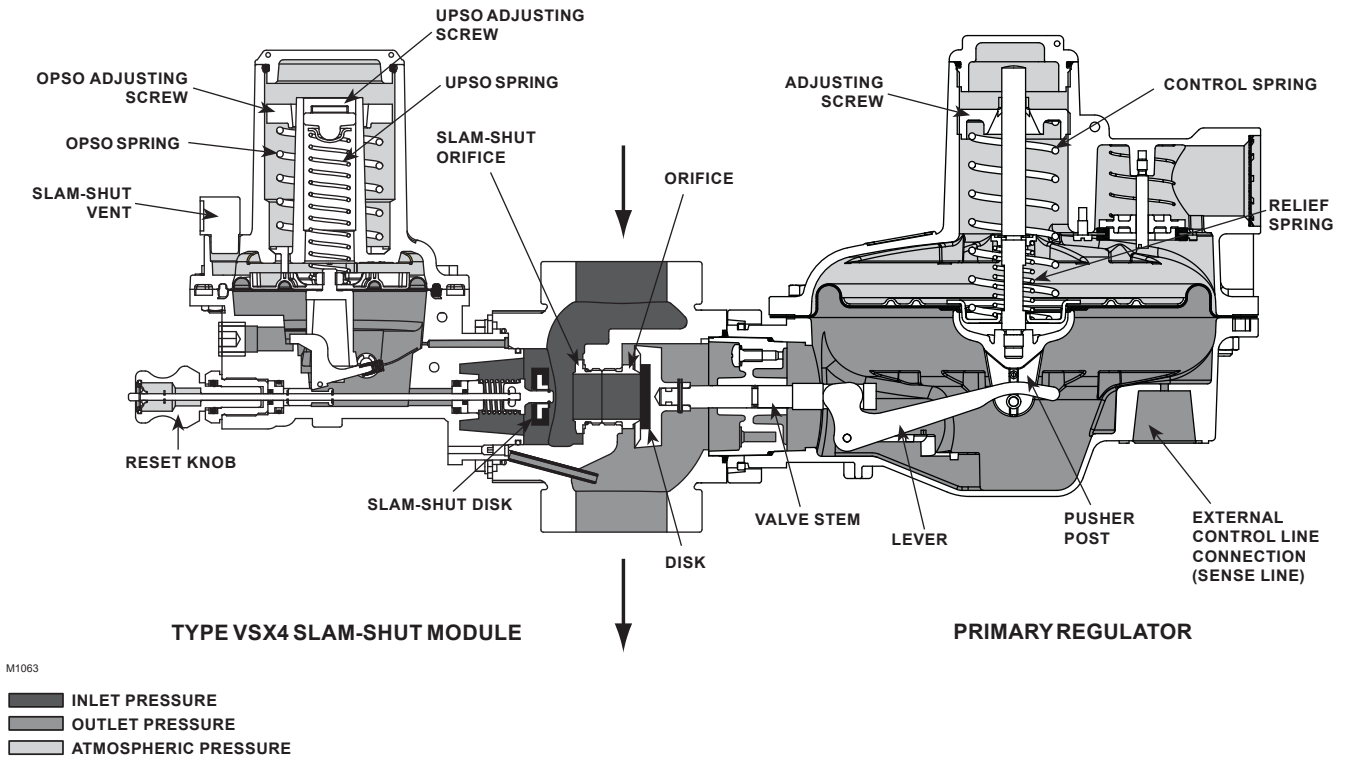


Figure 8. Type CS404ET Externally Registered Regulator with Slam-shut Operational Schematic

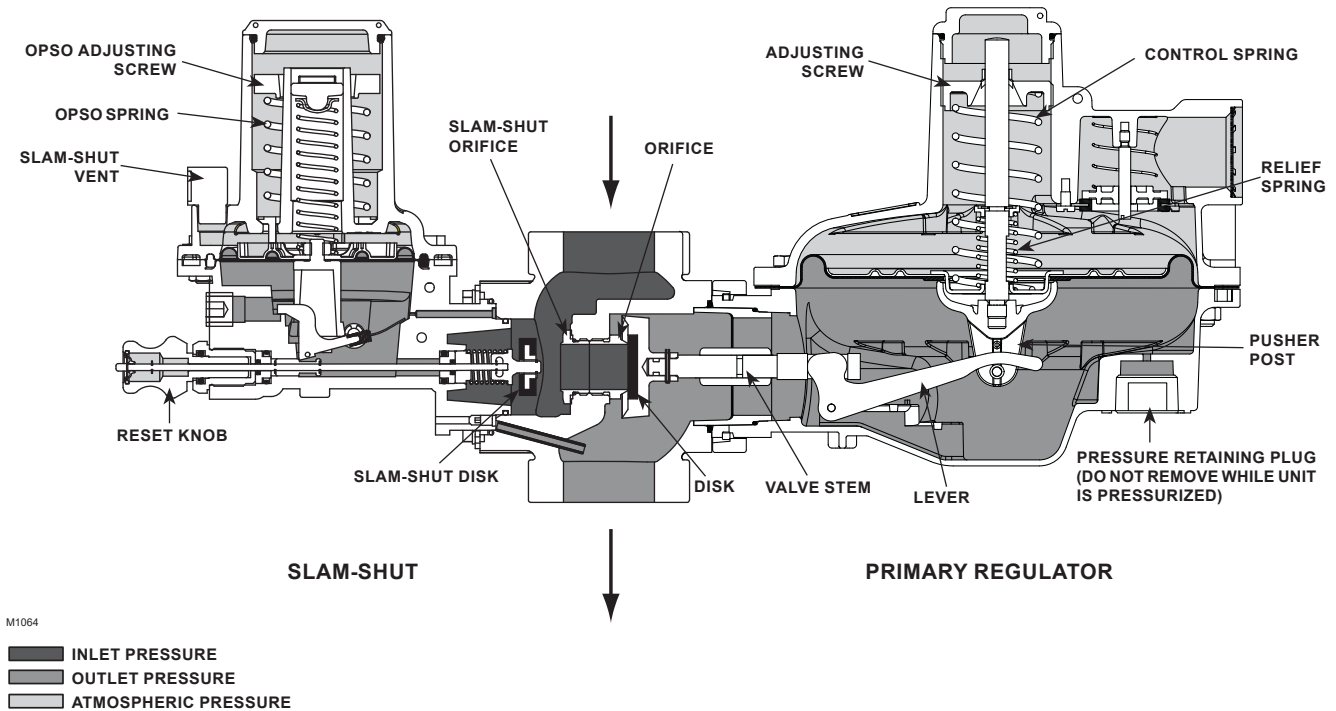


Figure 9. Type CS404IT Internally Registered Regulator with Slam-shut Operational Schematic

Installation

The CS400 Series regulators may be installed in any position. However, the spring case vent should be pointed downward. If gas escaping through the CS400 Series internal relief valve could constitute a hazard, the spring case vent must be piped to a location where escaping gas will not be hazardous. If the vented gas will be piped to another location, use obstruction-free tubing or piping at least equal in size to the vent and the end of the vent pipe must be protected from anything that might clog it. Regulators with External Registration require the use of an external control line.

Downstream Control Line Connection

A CS400 Series regulator with an EN, ET or ER in the type number has a blocked throat, an O-ring stem seal and a 3/4 NPT control line tapping in the lower diaphragm casing, Figure 5. A regulator with a downstream control line is used for monitoring installations or other applications where there are other equipment installed between the regulator and the pressure control point. The O-ring stem seal helps separate body pressure from diaphragm case pressure on monitor installations where leakage cannot be tolerated.

Overpressure Protection

The CS400 Series regulators have outlet pressure ratings that are lower than their inlet pressure ratings. A pressure relieving or pressure limiting device is needed for Types CS400IN, CS400IT, CP400EN and CS400ET if inlet pressure can exceed the outlet pressure rating as these regulators do not have standard internal relief, high outlet pressure shutoff or integral slam-shut module. Optional internal relief constructions are available and denoted by the last letter of the Type Number suffix and are defined in the following paragraphs.

Overpressuring any portion of a regulator or associated equipment may cause personal injury, leakage or property damage due to bursting of pressure-containing parts or explosion of accumulated gas. Provide appropriate pressure relieving or pressure limiting devices to ensure that the limits in the Specifications section are not exceeded. Regulator operation within ratings does not prevent the possibility of damage from external sources or from debris in the pipeline.

Internal Relief “R”

Type numbers with the “R” suffix, e.g. Type CS400IR, provide internal relief discharge across the diaphragm assembly (Figure 4) to minimize overpressure. Any outlet pressure above the start-to-discharge point of the non-adjustable relief spring moves the diaphragm off the relief seat, allowing excess pressure to discharge through the vent. If emergency conditions should exist that prevent normal operation of the regulator or internal relief valve, the relief valve stem acts as a secondary travel stop contacting the underside of the closing cap and stopping the upward travel of the relief seat. Since the diaphragm continues to rise as downstream pressure builds, the diaphragm lifts off of the relief seat to provide relief operation. The secondary travel stop for internal relief is not available on token relieving units. See Figures 10, 11, 12, 13 and 14 for relief capacity.

Token Relief “T”

Type numbers with the “T” suffix, e.g. Type CS400IT, provide low capacity/token internal relief. Token relief provides relief only from minor overpressure caused by nicks or dents on the orifice or disk or by thermal expansion of gas in the downstream line. Token relief also provides a token or signal, in the form of odor, that an overpressure situation is occurring. Start-to-discharge values of the Token relief are consistent with the Internal relief values found in Table 4.

Non-Relieving “N”

Type numbers with the “N” suffix, e.g. Type CS400IN, do NOT provide internal relief discharge across the diaphragm assembly.

Integral True-Monitor™ Protection

Types CS403IN, CS403EN, CS403IT and CS403ET combine the operation of a conventional two-regulator wide-open monitor set into one body. The Integral True-Monitor is installed on the inlet side of the body and serves to throttle flow and maintain an acceptable downstream pressure in the case where the primary regulator fails to regulate. Unlike multiple seat designs that rely on the primary regulator for all protection against loss of pressure control modes, the CS403 Series provides protection from a wide variety of conditions that could cause the primary regulator not to regulate downstream pressure.

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Refer to Figures 6 and 7. If the primary regulator ceases to control downstream pressure, outlet pressure will rise underneath the diaphragm of the integral monitor, which will assume control of the downstream pressure.

Table 5 shows a comparison between the integral True-Monitor™ protection and the protection offered by an backup orifice device, which seals on a secondary seating surface should the primary orifice seating surface or disk become damaged.

Pressure Registration

The Integral True-Monitor has the options for internal pressure registration and external registration, denoted by the “I” and “E” in the type number, respectively. The method of pressure registration is dependent on the registration of the primary regulator, see Figures 6 and 7. The wide-open monitor’s registration should match the registration of the primary regulator, if the primary regulator’s registration is internal, then the wide-open monitor regulator’s registration must also be internal, if the primary regulator is external, then the monitor must also be external.

Refer to the relief sizing coefficients and the Capacity Information section to determine the required relief valve capacity.

Integral Type VSX4 Slam-Shut Module

The Type VSX4 slam-shut module on the Type CS404 regulator is a fast acting shut-off device that provides overpressure (OPSO) or over and underpressure (OPSO/UPS0) protection by shutting off the flow of gas to the downstream system. The Type VSX4’s actions are independent of the CS404 Series regulator and of variations to the inlet pressure. The Type VSX4 provides the option of internal or external downstream pressure registration dependent on the registration of the primary regulator, see Figures 8 and 9. External registration requires a downstream sensing line.

Refer to the relief sizing coefficients and the Capacity Information section to determine the required relief valve capacity.

Capacity Information

Tables 9, 11, 12, 14, 15, 16, 17, 19, 20, 21, 22, 24, 25, 26, 27, 29 through 71 provide natural gas regulating capacities at selected inlet pressures, outlet pressure settings and body outlet sizes. Tables 70 and 71 provide capacities specifically for Pressure Factor Measurement applications. Flows are in

SCFH (60°F and 14.7 psia) and Nm³/h (0°C and 1.01325 bar) of 0.6 specific gravity natural gas. To determine equivalent capacities for air, propane, butane or nitrogen, multiply the capacity number in the tables by the following appropriate conversion factor: 0.775 for air, 0.628 for propane, 0.548 for butane or 0.789 for nitrogen. For gases of other specific gravities, multiply the given capacity by 0.775 and divide by the square root of the appropriate specific gravity.

Relief Sizing

For critical flow:

To determine wide-open flow capacities for relief sizing of 0.6 specific gravity natural gas at 60°F at critical pressure drops (absolute outlet pressure equal to approximately one-half or less than one-half of the absolute inlet pressure), use the following formula:

$$Q = P_{1abs}(C_g)(1.29)$$

For subcritical flow:

If pressure drops are lower than critical (absolute outlet pressure greater than approximately one-half the absolute inlet pressure), use the following formula and convert according to the factors in the preceding paragraph if necessary:

$$Q = \sqrt{\frac{520}{GT}} C_g P_1 \text{SIN} \left[\frac{3417}{C_1} \sqrt{\frac{\Delta P}{P_1}} \right] \text{DEG}$$

where:

- C_1 = C_g/C_v (see Table 2)
- C_g = Gas sizing coefficient (see Table 2)
- G = Gas specific gravity (air = 1.0)
- P_1 = Regulator inlet pressure, psi a
- ΔP = Pressure drop across regulator, psig
- Q = Gas flow rate, SCFH
- T = Absolute temperature of gas at inlet, °Rankine

Note

Due to boost, the above formulas cannot be used to obtain correct regulating capacities for regulators with internal registration.

The following capacities tables were obtained using inlet and outlet piping the same size as the regulator body size. The body size indicated in the tables refers to the outlet side of the body.

Table 9. Type CS400 Internal Registration Flow Capacities for 7 in. w.c. / 17 mbar Setpoint

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	Drop	Boost		
7 in. w.c.	-1 in. w.c.	2 in. w.c.	6 to 8 in. w.c.	GE30188X012 / Gold
17 mbar	-2 mbar	5 mbar	15 to 20 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4															
0.5	0.03	100	2.6	240	6.4	160	4.2	200	5.3	290	7.7	370	9.9	630	16.9	560	15.0
1	0.07	170	4.5	320	8.6	250	6.7	330	8.8	630	16.9	650	17.4	660	17.7	730	19.5
2	0.14	260	6.9	570	15.3	510	13.6	770	20.6	660	17.7	880	23.6	1100	29.5	1200	32.2
3	0.21	390	10.4	700	18.8	690	18.5	710	19.0	860	23.0	1100	29.5	1700	45.6	1800	48.3
5	0.34	500	13.4	750	20.1	800	21.4	970	26.0	1300	34.8	1600	42.9	2700	72.4	3200	85.9
10	0.69	750	20.1	1100	29.5	1200	32.2	1900	51.0	2500	67.1	3300	88.5	3300	88.5	3900	105
15	1.0	1000	26.8	1400	37.5	1700	45.6	2800	75.1	3200	85.9	3300	88.5	3300	88.5	3900	105
20	1.4	1100	29.5	1600	42.9	1900	51.0	3200	85.9	3200	85.9	3300	88.5	3300	88.5	3900	105
30	2.1	1500	40.2	2100	56.3	2700	72.4	3300	88.5	2400	64.4	2700	72.4	3300	88.5		
40	2.8	1900	51.0	2600	69.7	2800	75.1	2000	53.6	2100	56.3	1700	45.6				
50	3.4	2200	59.0	3000	80.4	2800	75.1	2000	53.6	1600	42.9						
60	4.1	2600	69.7	1900	50.9	1900	51.0	1500	40.2	1600	42.9						
80	5.5	3100	83.2	1700	45.6	1900	51.0	1500	40.2								
100	6.9	1700	45.6	1700	45.6	1900	51.0	1500	40.2								
125	8.6	1700	45.6	1700	45.6	1900	51.0										
psig	bar	Body Size: NPS 1-1/2															
0.5	0.03	120	3.2	250	6.7	210	5.6	220	5.9	280	7.5	340	9.1	470	12.6	720	19.3
1	0.07	170	4.5	330	8.8	260	6.9	330	8.8	620	16.6	840	22.5	620	16.6	740	19.8
2	0.14	260	6.9	450	12.1	500	13.4	770	20.6	730	19.5	850	22.8	1100	29.5	1300	34.8
3	0.21	310	8.3	700	18.8	680	18.2	780	20.9	980	26.3	1200	32.2	1400	37.5	1800	48.3
5	0.34	540	14.4	770	20.6	940	25.2	950	25.5	1300	34.8	2300	61.7	3300	88.5	4400	118
10	0.69	770	20.6	1100	29.5	1200	32.2	2000	53.6	3000	80.5	3300	88.5	4300	115	4400	118
15	1.0	990	26.5	1400	37.5	1800	48.3	2900	77.8	3300	88.5	3300	88.5	4300	115	4400	118
20	1.4	1100	29.5	1600	42.9	2100	56.3	3300	88.5	3300	88.5	3300	88.5	4300	115	4400	118
30	2.1	1500	40.2	2100	56.3	2300	61.7	3300	88.5	3300	88.5	2500	67.1	2800	75.1		
40	2.8	1900	51.0	2600	69.7	2500	67.1	3300	88.5	2500	67.1	2500	67.1				
50	3.4	2200	59.0	1900	50.9	1900	51.0	2900	77.8	2200	59.0						
60	4.1	2200	59.0	2000	53.6	1800	48.3	2500	67.1	2000	53.6						
80	5.5	2200	59.0	2100	56.3	1800	48.3	2200	59.0								
100	6.9	1800	48.3	1600	42.9	1800	48.3	2200	59.0								
125	8.6	1600	42.9	1600	42.9	1800	48.3										
psig	bar	Body Size: NPS 2															
0.5	0.03	130	3.4	250	6.7	200	5.3	260	6.9	260	6.9	420	11.2	380	10.2	750	20.1
1	0.07	160	4.2	330	8.8	280	7.5	330	8.8	590	15.8	610	16.3	660	17.7	760	20.4
2	0.14	240	6.4	450	12.1	400	10.7	700	18.7	700	18.7	840	22.5	1100	29.5	1100	29.5
3	0.21	320	8.5	700	18.8	660	17.7	610	16.3	850	22.8	1100	29.5	1500	40.2	1700	45.6
5	0.34	540	14.4	770	20.6	730	19.5	790	21.2	1100	29.5	1900	51.0	2400	64.4	2700	72.4
10	0.69	700	18.7	1100	29.5	1200	32.2	1500	40.2	2400	64.4	4000	107	4400	118	4400	118
15	1.0	980	26.3	1400	37.5	1700	45.6	2500	67.1	3500	93.9	4200	113	4400	118	4400	118
20	1.4	1100	29.5	1600	42.9	2100	56.3	3300	88.5	3500	93.9	4400	118	4400	118	4400	118
30	2.1	1500	40.2	2100	56.3	2600	69.7	3300	88.5	3500	93.9	4400	118	3200	85.9		
40	2.8	1900	51.0	2600	69.7	3200	85.9	3300	88.5	3100	83.2	3200	85.9				
50	3.4	2200	59.0	1900	50.9	3200	85.9	3200	85.9	2800	75.1						
60	4.1	2600	69.7	2000	53.6	3200	85.9	3000	80.5	2500	67.1						
80	5.5	3100	83.2	2100	56.3	3000	80.5	2900	77.8								
100	6.9	3100	83.2	1600	42.9	3000	80.5	2900	77.8								
125	8.6	3100	83.2	1600	42.9	2800	75.1										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 Gray areas indicate limited capacities due to boost effects.

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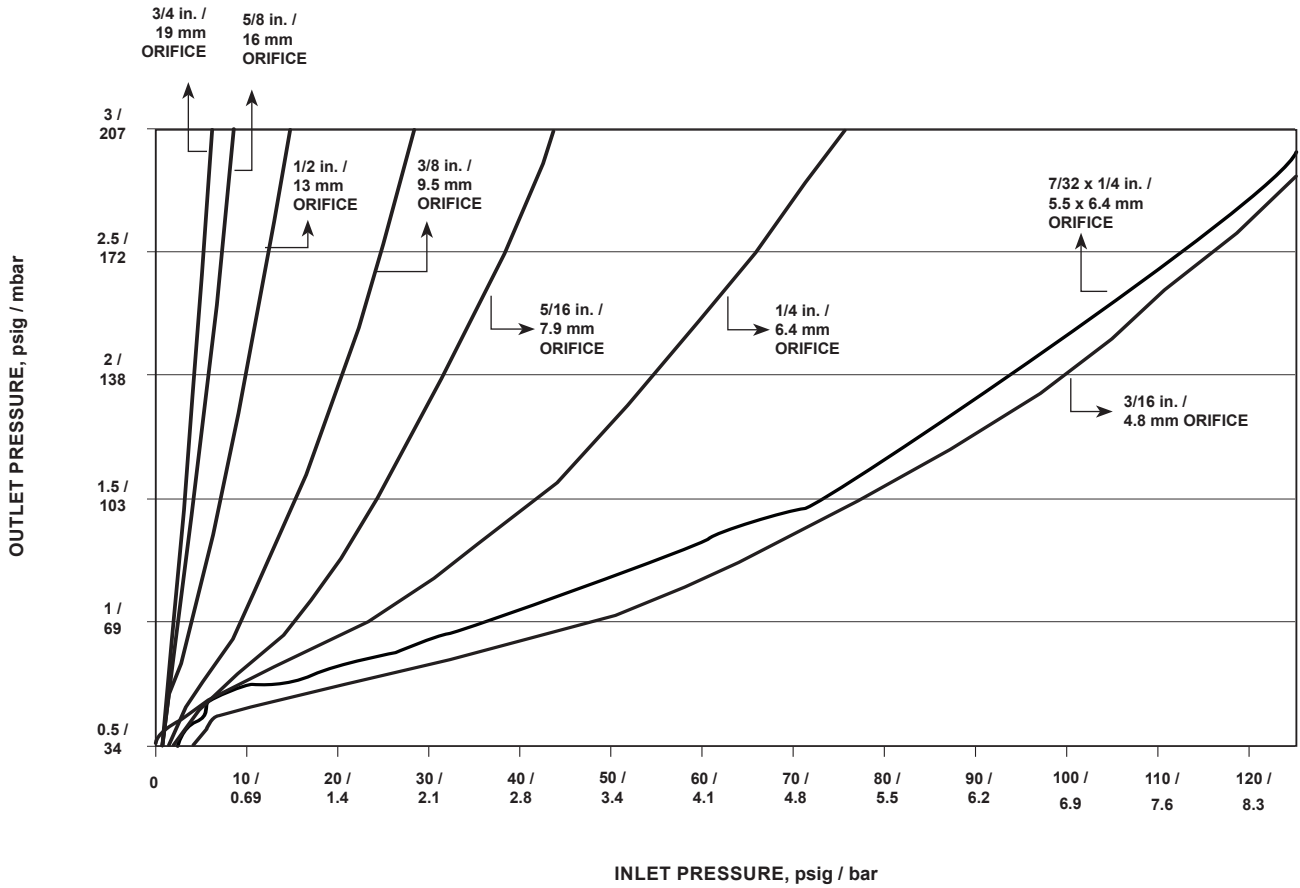


Figure 10. Type CS400IR Relief Curves (Blocked per Orifice Size) at 7 in. w.c. / 17 mbar Set Pressure

Table 10. Type CS400 Relief Table, 7 in. w.c. / 17 mbar Setpoint, Internal Registration

ORIFICE SIZE		REGULATOR SET PRESSURE		MAXIMUM INLET PRESSURE TO KEEP OUTLET PRESSURE AT/OR BELOW ⁽¹⁾			
				1 psig / 69 mbar		2 psig / 138 mbar	
In.	mm	In. w.c.	mbar	psig	bar	psig	bar
3/16	4.8	7	17	46	3.2	100	6.9
7/32 x 1/4	5.5 x 6.4			35	2.4	94	6.5
1/4	6.4			23	1.6	54	3.7
5/16	7.9			15	1.0	31	2.1
3/8	9.5			9	0.62	20	1.4

1. Relief values obtained by blocking regulator open per orifice.

Table 11. Type CS400 Internal Registration Flow Capacities for 11 in. w.c. / 27 mbar Setpoint

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	Drop	Boost		
11 in. w.c.	-2 in. w.c.	2 in. w.c.	7.5 to 11 in. w.c.	GE30189X012 / Blue
27 mbar	-5 mbar	5 mbar	19 to 27 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4															
0.5	0.03	150	4.0	260	7.0	220	5.9	300	8.0	320	8.5	530	14.2	710	19.0	550	14.7
1	0.07	210	5.6	360	9.6	320	8.5	680	18.2	700	18.7	840	22.5	810	21.7	1000	26.8
2	0.14	320	8.5	570	15.3	600	16.1	940	25.2	920	24.6	1100	29.5	1500	40.2	1600	42.9
3	0.21	450	12.0	710	19.0	700	18.7	1100	29.5	1100	29.5	1500	40.2	2000	53.6	2300	61.7
5	0.34	540	14.4	850	22.8	920	24.6	1200	32.2	1500	40.2	2100	56.3	2900	77.8	3200	85.9
10	0.69	780	20.9	1100	29.5	1300	34.8	2100	56.3	2600	69.7	3500	93.9	3900	105	4300	115
15	1.0	980	26.3	1400	37.5	1700	45.6	2800	75.1	3400	91.2	3500	93.9	3900	105	4300	115
20	1.4	1100	29.5	1600	42.9	2000	53.6	3400	91.2	3400	91.2	3500	93.9	2200	59.0	4300	115
30	2.1	1500	40.2	2100	56.3	2800	75.1	3400	91.2	3400	91.2	3500	93.9	2200	59.0		
40	2.8	1800	48.3	2600	69.7	2800	75.1	2700	72.4	2400	64.4	1800	48.3				
50	3.4	2200	59.0	3100	83.1	2800	75.1	2500	67.1	1700	45.6						
60	4.1	2500	67.1	2300	61.6	2600	69.7	2400	64.4	1700	45.6						
80	5.5	2500	67.1	2000	53.6	2000	53.6	2400	64.4								
100	6.9	1700	45.6	2000	53.6	1900	51.0	1600	42.9								
125	8.6	1700	45.6	2000	53.6	1900	51.0										
psig	bar	Body Size: NPS 1-1/2															
0.5	0.03	100	2.6	260	7.0	160	4.2	240	6.4	340	9.1	410	11.0	530	14.2	690	18.5
1	0.07	170	4.5	360	9.6	320	8.5	440	11.8	700	18.7	970	26.0	880	23.6	970	26.0
2	0.14	280	7.5	510	13.7	550	14.7	840	22.5	970	26.0	1200	32.2	1500	40.2	2000	53.6
3	0.21	410	11.0	700	18.8	710	19.0	930	24.9	1100	29.5	1600	42.9	2200	59.0	2600	69.7
5	0.34	560	15.0	840	22.5	970	26.0	1200	32.2	1700	45.6	2700	72.4	3500	93.9	3500	93.9
10	0.69	800	21.4	1200	32.2	1400	37.5	2100	56.3	3000	80.5	3500	93.9	3500	93.9	4800	129
15	1.0	990	26.5	1400	37.5	1800	48.3	2900	77.8	3300	88.5	3500	93.9	3500	93.9	4800	129
20	1.4	1100	29.5	1600	42.9	2100	56.3	3300	88.5	3300	88.5	3500	93.9	3500	93.9	4900	134
30	2.1	1500	40.2	2100	56.3	2800	75.1	3300	88.5	3300	88.5	2500	67.1	1900	51.0		
40	2.8	1800	48.3	2600	69.7	3200	85.9	3300	88.5	3000	80.5	2500	67.1				
50	3.4	2200	59.0	2200	59.0	3200	85.9	3300	88.5	1800	48.3						
60	4.1	2600	69.7	2000	53.6	2000	53.6	3200	85.9	1700	45.6						
80	5.5	2800	75.1	2200	59.0	2000	53.6	1900	51.0								
100	6.9	2800	75.1	1700	45.6	2000	53.6	1900	51.0								
125	8.6	2800	75.1	1700	45.6	2000	53.6										
psig	bar	Body Size: NPS 2															
0.5	0.03	110	2.9	270	7.2	200	5.3	270	7.2	340	9.1	420	11.2	620	16.6	870	23.3
1	0.07	190	5.1	350	9.4	270	7.2	430	11.5	690	18.5	990	26.5	820	22.0	1000	26.8
2	0.14	290	7.7	560	15.0	530	14.2	800	21.4	940	25.2	1100	29.5	1400	37.5	1700	45.6
3	0.21	410	11.0	690	18.5	730	19.5	870	23.3	1200	32.2	1400	37.5	1900	51.0	2400	64.4
5	0.34	550	14.7	810	21.7	920	24.6	1100	29.5	1500	40.2	2200	59.0	3100	83.2	3500	93.9
10	0.69	790	21.2	1100	29.5	1300	34.8	1900	51.0	2800	75.1	4000	107	4200	113	4800	129
15	1.0	1000	26.8	1400	37.5	1800	48.3	2800	75.1	3700	99.3	4000	107	4200	113	4800	129
20	1.4	1100	29.5	1600	42.9	2000	53.6	3400	91.2	3700	99.3	4100	110	4200	113	4800	129
30	2.1	1500	40.2	2100	56.3	2700	72.4	3400	91.2	3700	99.3	4100	110	2600	69.7		
40	2.8	1900	51.0	2600	69.7	3200	85.9	3400	91.2	3200	85.9	3000	80.5				
50	3.4	2200	59.0	3100	83.1	3200	85.9	3400	91.2	3200	85.9						
60	4.1	2500	67.1	3500	93.8	3200	85.9	3400	91.2	3200	85.9						
80	5.5	3200	85.9	2600	69.7	3200	85.9	3400	91.2								
100	6.9	3300	88.5	2700	72.4	3200	85.9	3000	80.5								
125	8.6	3300	88.5	2700	72.4	3200	85.9										

- Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 - Gray areas indicate limited capacities due to boost effects.

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Table 12. Type CS400 Internal Registration Flow Capacities for 14 in. w.c. / 35 mbar Setpoint

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	Droop	Boost		
14 in. w.c.	-2 in. w.c.	2 in. w.c.	10 to 14 in. w.c.	GE30224X012 / Unpainted
35 mbar	-5 mbar	5 mbar	25 to 35 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4															
psig	bar	190	5.1	340	9.1	280	7.5	380	10.2	680	18.2	860	23.0	890	23.8	1000	26.8
2	0.14	320	8.5	550	14.7	540	14.4	770	20.6	910	24.4	1100	29.5	1300	34.8	1700	45.6
3	0.21	390	10.4	690	18.5	700	18.7	840	22.5	1100	29.5	1500	40.2	2000	53.6	2200	59.0
5	0.34	530	14.2	820	22.0	880	23.6	1100	29.5	1500	40.2	2100	56.3	2700	72.4	3100	83.2
10	0.69	770	20.6	1100	29.5	1300	34.8	2000	53.6	2600	69.7	3300	88.5	3600	96.6	4100	110
15	1.0	970	26.0	1400	37.5	1700	45.6	2600	69.7	3400	91.2	3600	96.6	3600	96.6	4300	115
20	1.4	1100	29.5	1600	42.9	2000	53.6	3200	85.9	3400	91.2	3600	96.6	3600	96.6	4300	115
30	2.1	1500	40.2	2100	56.3	2300	61.7	3200	85.9	3400	91.2	3600	96.6	3300	88.5		
40	2.8	1800	48.3	2600	69.7	2300	61.7	1900	51.0	2300	61.7	2000	53.6				
50	3.4	2200	59.0	3100	83.1	2300	61.7	1900	51.0	2300	61.7						
60	4.1	2500	67.1	3500	93.8	2300	61.7	1900	51.0	2300	61.7						
80	5.5	2500	67.1	2100	56.3	2000	53.6	1900	51.0								
100	6.9	2500	67.1	2100	56.3	1900	51.0	1900	51.0								
125	8.6	1600	42.9	2100	56.3	1900	51.0										
		Body Size: NPS 1-1/2															
psig	bar	180	4.8	340	9.1	260	6.9	420	11.2	680	18.2	870	23.3	840	22.5	840	22.5
2	0.14	280	7.5	490	13.1	530	14.2	760	20.4	860	23.0	1000	26.8	1300	34.8	1600	42.9
3	0.21	370	9.9	690	18.5	740	19.8	870	23.3	980	26.3	1500	40.2	2100	56.3	2200	59.0
5	0.34	560	15.0	810	21.7	930	24.9	1100	29.5	1500	40.2	2300	61.7	3500	93.9	3500	93.9
10	0.69	760	20.4	1100	29.5	1300	34.8	1900	51.0	2700	72.4	3500	93.9	3800	102	4500	121
15	1.0	980	26.3	1400	37.5	1800	48.3	2600	69.7	3400	91.2	3500	93.9	3800	102	4500	121
20	1.4	1100	29.5	1600	42.9	2100	56.3	3200	85.9	3400	91.2	3500	93.9	3800	102	4500	121
30	2.1	1500	40.2	2100	56.3	2800	75.1	3400	91.2	3400	91.2	3300	88.5	3000	80.5		
40	2.8	1900	51.0	2600	69.7	2900	77.8	3400	91.2	3100	83.2	2800	75.1				
50	3.4	2200	59.0	2300	61.6	2900	77.8	3400	91.2	2900	77.8						
60	4.1	2600	69.7	2000	53.6	2900	77.8	3400	91.2	2800	75.1						
80	5.5	3300	88.5	2300	61.6	2900	77.8	3400	91.2								
100	6.9	3500	93.9	1700	45.6	2900	77.8	3400	91.2								
125	8.6	3600	96.6	1700	45.6	2900	77.8										
		Body Size: NPS 2															
psig	bar	170	4.5	330	8.8	230	6.1	350	9.3	530	14.2	890	23.8	790	21.2	960	25.7
2	0.14	310	8.3	480	12.9	450	12.0	760	20.4	940	25.2	1000	26.8	1400	37.5	1600	42.9
3	0.21	360	9.6	680	18.2	700	18.7	860	23.0	1100	29.5	1400	37.5	1700	45.6	2200	59.0
5	0.34	560	15.0	790	21.2	890	23.8	1100	29.5	1600	42.9	2200	59.0	2800	75.1	3500	93.9
10	0.69	760	20.4	1100	29.5	1300	34.8	1900	51.0	2600	69.7	3300	88.5	3400	91.2	4500	121
15	1.0	980	26.3	1400	37.5	1800	48.3	2600	69.7	3400	91.2	3500	93.9	3500	93.9	4800	129
20	1.4	1100	29.5	1600	42.9	2100	56.3	3200	85.9	3500	93.9	3600	96.6	3600	96.6	4800	129
30	2.1	1500	40.2	2100	56.3	2700	72.4	3400	91.2	3600	96.6	4000	107	2400	64.4		
40	2.8	1900	51.0	2600	69.7	3200	85.9	3500	93.9	3600	96.6	2700	72.4				
50	3.4	2200	59.0	3100	83.1	3200	85.9	3700	99.3	2900	77.8						
60	4.1	2600	69.7	3500	93.8	3200	85.9	3700	99.3	2800	75.1						
80	5.5	3100	83.2	2700	72.4	2800	75.1	3700	99.3								
100	6.9	3100	83.2	2800	75.0	2600	69.7	3700	99.3								
125	8.6	3100	83.2	2800	75.0	2600	69.7										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 Gray areas indicate limited capacities due to boost effects.

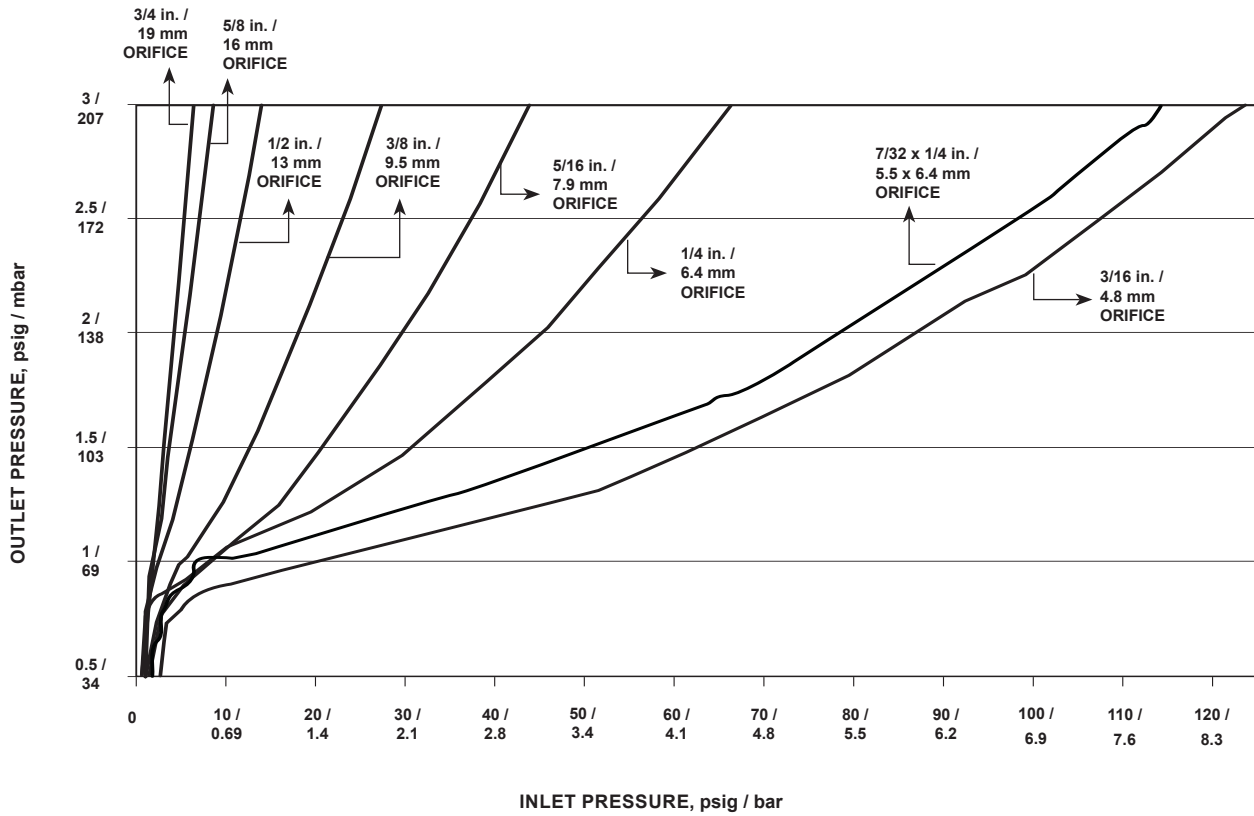


Figure 11. Type CS400IR Relief Curves (Blocked per Orifice Size) at 14 in. w.c. / 35 mbar Set Pressure

Table 13. Type CS400 Relief Table, 14 in. w.c. / 35 mbar Setpoint, Internal Registration

ORIFICE SIZE		REGULATOR SET PRESSURE		MAXIMUM INLET PRESSURE TO KEEP OUTLET PRESSURE AT/OR BELOW ⁽¹⁾			
				2 psig / 138 mbar		2.5 psig / 172 mbar	
In.	mm	In. w.c.	mbar	psig	bar	psig	bar
3/16	4.8	14	35	87	6.0	107	7.4
7/32 x 1/4	5.5 x 6.4			76	5.2	94	6.5
1/4	6.4			45	3.1	56	3.9
5/16	7.9			30	2.1	37	2.6
3/8	9.5			18	1.2	23	1.6

1. Relief values obtained by blocking regulator open per orifice.

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Table 14. Type CS400 Internal Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
1 psig	-0.16 psi	0.16 psi	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-11 mbar	11 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4																	
2	0.14	260	6.9	470	12.6	470	12.6	730	19.5	970	26.0	1000	26.8	1500	40.2	1700	45.6
3	0.21	350	9.3	650	17.4	670	17.9	910	24.4	1100	29.5	1500	40.2	1900	51.0	2300	61.7
5	0.34	520	13.9	810	21.7	900	24.1	1200	32.2	1500	40.2	2100	56.3	3100	83.2	3400	91.2
10	0.69	770	20.6	1100	29.5	1300	34.8	2000	53.6	2600	69.7	3600	96.6	5000	134	6000	161
15	1.0	980	26.3	1400	37.5	1600	42.9	2700	72.4	3700	99.3	4900	132	6000	161	6000	161
20	1.4	1100	29.5	1600	42.9	2100	56.3	3300	88.5	4100	110	4900	132	6000	161	6000	161
30	2.1	1500	40.2	2100	56.3	2700	72.4	4300	115	4400	118	4900	132	6000	161		
40	2.8	1800	48.3	2600	69.7	3400	91.2	4600	123	4400	118	4900	132				
50	3.4	2200	59.0	3100	83.1	4000	107	4600	123	4400	118						
60	4.1	2400	64.4	3500	93.8	4700	126	4600	123	4400	118						
80	5.5	3200	85.9	4500	120.6	4700	126	4600	123								
100	6.9	3200	85.9	5400	144.7	4700	126	4600	123								
125	8.6	3200	85.9	6400	171.5	4700	126										
Body Size: NPS 1-1/2																	
2	0.14	270	7.2	430	11.5	490	13.1	740	19.8	960	25.7	1100	29.5	1200	32.2	1500	40.2
3	0.21	370	9.9	630	16.9	680	18.2	950	25.5	1000	26.8	1500	40.2	1900	51.0	2300	61.7
5	0.34	540	14.4	840	22.5	930	24.9	1100	29.5	1600	42.9	2400	64.4	3300	88.5	4200	113
10	0.69	820	22.0	1100	29.5	1300	34.8	1800	48.3	2700	72.4	4400	118	5600	150	6000	161
15	1.0	1000	26.8	1400	37.5	1800	48.3	2500	67.1	3700	99.3	5500	148	5600	150	6000	161
20	1.4	1100	29.5	1600	42.9	2100	56.3	3300	88.5	4600	123	5500	148	5600	150	6000	161
30	2.1	1500	40.2	2100	56.3	2800	75.1	4700	126	5500	148	5500	148				
40	2.8	1800	48.3	2600	69.7	3300	88.5	5500	148	5500	148	5500	148				
50	3.4	2200	59.0	3000	80.4	3900	105	5500	148	5500	148						
60	4.1	2600	69.7	3600	96.5	4400	118	5500	148	5500	148						
80	5.5	3300	88.5	4500	120.6	4400	118	5500	148								
100	6.9	4000	107	5400	144.7	4400	118	5500	148								
125	8.6	4000	107	6700	179.6	4400	118										
Body Size: NPS 2																	
2	0.14	270	7.2	480	12.9	410	11.0	690	18.5	940	25.2	1000	26.8	1400	37.5	1500	40.2
3	0.21	370	9.9	640	17.2	640	17.1	920	24.6	1000	26.8	1400	37.5	1800	48.3	2200	59.0
5	0.34	530	14.2	800	21.4	920	24.6	1100	29.5	1500	40.2	2100	56.3	2700	72.4	3600	96.6
10	0.69	820	22.0	1100	29.5	1300	34.8	1800	48.3	2500	67.1	4000	107	5100	137	7100	191
15	1.0	1000	26.8	1400	37.5	1800	48.3	2500	67.1	3600	96.6	5200	140	7100	191	7100	191
20	1.4	1100	29.5	1600	42.9	2100	56.3	3300	88.5	4600	123	6900	185	7100	191	7100	191
30	2.1	1500	40.2	2100	56.3	2600	69.7	4000	107	6100	164	6900	185	7100	191		
40	2.8	1800	48.3	2600	69.7	3200	85.9	5600	150	6900	185	6900	185				
50	3.4	2200	59.0	3000	80.4	4000	107	6600	177	6900	185						
60	4.1	2600	69.7	3500	93.8	4500	121	6600	177	6900	185						
80	5.5	3300	88.5	4500	120.6	6000	161	6600	177								
100	6.9	4000	107	5400	144.7	6000	161	6600	177								
125	8.6	4000	107	6500	174.2	6000	161										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 15. Type CS400 Internal Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
1 psig	-0.31 psi	0.31 psi	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-21 mbar	21 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4																	
2	0.14	300	8.0	550	14.7	570	15.3	920	24.6	1200	32.2	1500	40.2	2400	64.4	2800	75.1
3	0.21	400	10.7	700	18.8	750	20.1	1100	29.5	1400	37.5	2100	56.3	2700	72.4	3500	93.9
5	0.34	550	14.7	880	23.6	1000	26.8	1500	40.2	1900	51.0	2800	75.1	4300	115	5000	134
10	0.69	820	22.0	1200	32.2	1400	37.5	2400	64.4	3000	80.5	4500	121	6700	180	7600	204
15	1.0	1000	26.8	1400	37.5	1800	48.3	3000	80.5	4000	107	5800	156	7600	204	7600	204
20	1.4	1100	29.5	1600	42.9	2100	56.3	3600	96.6	4600	123	7400	199	7600	204	7600	204
30	2.1	1500	40.2	2100	56.3	2800	75.1	4600	123	6300	169	7600	204	7600	204		
40	2.8	1800	48.3	2600	69.7	3400	91.2	5800	156	7600	204	7600	204				
50	3.4	2200	59.0	3100	83.1	4000	107	6400	172	7600	204						
60	4.1	2500	67.1	3500	93.8	4700	126	7600	204	7600	204						
80	5.5	3300	88.5	4400	117.9	5800	156	7600	204								
100	6.9	4000	107	5400	144.7	7100	191	7600	204								
125	8.6	4800	129	6600	176.9	7100	191										
Body Size: NPS 1-1/2																	
2	0.14	310	8.3	510	13.7	570	15.3	910	24.4	1100	29.5	1700	45.6	2200	59.0	2700	72.4
3	0.21	410	11.0	670	18.0	760	20.4	1100	29.5	1400	37.5	2200	59.0	3200	85.9	3800	102
5	0.34	570	15.3	870	23.3	990	26.5	1500	40.2	2000	53.6	3100	83.2	4600	123	5800	156
10	0.69	850	22.8	1200	32.2	1400	37.5	2300	61.7	3100	83.2	5100	137	7700	207	9500	255
15	1.0	1000	26.8	1400	37.5	1800	48.3	3000	80.5	4000	107	6600	177	8000	215	9500	255
20	1.4	1200	32.2	1600	42.9	2100	56.3	3600	96.6	4900	132	7900	212	8000	215	9500	255
30	2.1	1500	40.2	2100	56.3	2800	75.1	4700	126	6300	169	7900	212	8000	215		
40	2.8	1900	51.0	2600	69.7	3400	91.2	5800	156	7700	207	7900	212				
50	3.4	2300	61.7	3100	83.1	4000	107	6800	183	7700	207						
60	4.1	2600	69.7	3600	96.5	4600	123	7700	207	7700	207						
80	5.5	3300	88.5	4500	120.6	5600	150	7700	207								
100	6.9	4100	110	5400	144.7	7100	191	7700	207								
125	8.6	4900	132	6600	176.9	7100	191										
Body Size: NPS 2																	
2	0.14	310	8.3	570	15.3	520	13.9	860	23.0	1100	29.5	1600	42.9	2300	61.7	2600	69.7
3	0.21	420	11.2	680	18.2	700	18.7	1100	29.5	1400	37.5	2200	59.0	3000	80.5	3400	91.2
5	0.34	550	14.7	870	23.3	990	26.5	1500	40.2	2000	53.6	2900	77.8	4300	115	5600	150
10	0.69	830	22.2	1200	32.2	1400	37.5	2300	61.7	3100	83.2	5000	134	7600	204	9600	258
15	1.0	1000	26.8	1400	37.5	1800	48.3	3000	80.5	4100	110	6400	172	8000	215	9600	258
20	1.4	1100	29.5	1600	42.9	2100	56.3	3600	96.6	4900	132	7900	212	8000	215	9600	258
30	2.1	1500	40.2	2100	56.3	2700	72.4	4300	115	6300	169	7900	212	8000	215		
40	2.8	1900	51.0	2600	69.7	3300	88.5	5800	156	7900	212	7900	212				
50	3.4	2200	59.0	3100	83.1	4000	107	6900	185	7900	212						
60	4.1	2600	69.7	3500	93.8	4600	123	7700	207	7900	212						
80	5.5	3300	88.5	4500	120.6	6000	161	7700	207								
100	6.9	4000	107	5400	144.7	7100	191	7700	207								
125	8.6	5000	134	6600	176.9	7100	191										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

CS400 Series

Table 16. Type CS400 Internal Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
1 psig	-0.1 psi	0.01 psi	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-7 mbar	7 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4															
psig	bar																
2	0.14	240	6.4	400	10.7	380	10.2	600	16.1	860	23.0	830	22.2	1000	26.8	1200	32.2
3	0.21	310	8.3	620	16.6	630	16.9	710	19.0	840	22.5	1100	29.5	1400	37.5	1500	40.2
5	0.34	490	13.1	730	19.6	840	22.5	960	25.7	1300	34.8	1600	42.9	2300	61.7	2500	67.1
10	0.69	720	19.3	1100	29.5	1200	32.2	1700	45.6	2200	59.0	3000	80.5	4400	118	4600	123
15	1.0	930	24.9	1300	34.8	1500	40.2	2300	61.7	3300	88.5	3900	105	5100	137	6000	161
20	1.4	1000	26.8	1600	42.9	2000	53.6	3000	80.5	3800	102	3900	105	5100	137	6000	161
30	2.1	1400	37.5	2000	53.6	2700	72.4	3200	85.9	3800	102	3900	105	5100	137		
40	2.8	1700	45.6	2600	69.7	3400	91.2	3200	85.9	3800	102	3900	105				
50	3.4	2100	56.3	3100	83.1	3800	102	3200	85.9	4300	115						
60	4.1	2300	61.7	3500	93.8	3800	102	3200	85.9	4300	115						
80	5.5	3100	83.2	4500	120.6	3800	102	3200	85.9								
100	6.9	3600	96.6	5400	144.7	3800	102	3200	85.9								
125	8.6	4500	121	5800	155.4	3800	102										
		Body Size: NPS 1-1/2															
psig	bar																
2	0.14	240	6.4	370	9.9	350	9.3	620	16.6	780	20.9	830	22.2	910	24.4	1000	26.8
3	0.21	320	8.5	600	16.1	630	16.9	790	21.2	780	20.9	1000	26.8	1300	34.8	1600	42.9
5	0.34	520	13.9	790	21.2	860	23.0	840	22.5	1200	32.2	1700	45.6	2400	64.4	2800	75.1
10	0.69	710	19.0	1000	26.8	1100	29.5	1500	40.2	2100	56.3	3800	102.0	5300	142	6000	161
15	1.0	940	25.2	1300	34.8	1600	42.9	2200	59.0	3200	85.9	4900	132	5300	142	6000	161
20	1.4	1100	29.5	1500	40.2	1900	51.0	2800	75.1	4200	112.7	4900	132	5300	142	6000	161
30	2.1	1400	37.5	2100	56.3	2800	75.1	4000	107	4800	129	4900	132	5300	142		
40	2.8	1800	48.3	2500	67.0	3300	88.5	4000	107	4800	129	4100	110				
50	3.4	2200	59.0	3000	80.4	3800	102	4000	107	4800	129						
60	4.1	2500	67.1	3600	96.5	4000	107	4000	107	4800	129						
80	5.5	3300	88.5	3400	91.1	4000	107	3200	85.9								
100	6.9	4000	107	2900	77.7	4000	107	2900	77.8								
125	8.6	4000	107	6600	176.9	4000	107										
		Body Size: NPS 2															
psig	bar																
2	0.14	240	6.4	400	10.7	340	9.1	560	15.0	800	21.4	740	19.8	990	26.5	1100	29.5
3	0.21	320	8.5	610	16.3	590	15.8	820	22.0	730	19.5	1000	26.8	1200	32.2	1400	37.5
5	0.34	500	13.4	730	19.6	840	22.5	820	22.0	1100	29.5	1500	40.2	1900	51.0	2500	67.1
10	0.69	670	17.9	1000	26.8	1100	29.5	1300	34.8	2000	53.6	3100	83.2	4100	110	5500	148
15	1.0	970	26.0	1300	34.8	1600	42.9	1900	51.0	3100	83.2	4100	110	6500	174	6500	174
20	1.4	1100	29.5	1500	40.2	2000	53.6	2900	77.8	3900	105	6200	166	6500	174	6500	174
30	2.1	1500	40.2	2000	53.6	2500	67.1	3600	96.6	5900	158	6200	166	6500	174		
40	2.8	1800	48.3	2500	67.0	3100	83.2	5100	137	6000	161	6200	166				
50	3.4	2100	56.3	3000	80.4	4000	107	6000	161	6000	161						
60	4.1	2600	69.7	3500	93.8	4400	118	6000	161	6000	161						
80	5.5	3300	88.5	4500	120.6	6000	161	6000	161								
100	6.9	4000	107	5400	144.7	6000	161	6000	161								
125	8.6	5000	134	6500	174.2	6000	161										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 Gray areas indicate limited capacities due to boost effects.

Table 17. Type CS400 Internal Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
1 psig	-0.2 psi	0.2 psi	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-14 mbar	14 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4															
2	0.14	270	7.2	500	13.4	510	13.6	840	22.5	1000	26.8	1200	32.2	1700	45.6	2000	53.6
3	0.21	370	9.9	670	18.0	700	18.7	1000	26.8	1200	32.2	1700	45.6	2200	59.0	2700	72.4
5	0.34	530	14.2	840	22.5	940	25.2	1300	34.8	1700	45.6	2400	64.4	3400	91.2	4100	110
10	0.69	790	21.2	1200	32.2	1400	37.5	2200	59.0	2800	75.1	3900	105	5600	150	6700	180
15	1.0	1000	26.8	1400	37.5	1700	45.6	2900	77.8	3800	102	5300	142	7000	188	7800	209
20	1.4	1100	29.5	1600	42.9	2100	56.3	3500	93.9	4200	113	6800	183	7600	204	7800	209
30	2.1	1500	40.2	2100	56.3	2700	72.4	4700	126	6200	166	7600	204	7600	204		
40	2.8	1800	48.3	2600	69.7	3400	91.2	5800	156	7600	204	7600	204				
50	3.4	2200	59.0	3100	83.1	4000	107	6200	166	7600	204						
60	4.1	2500	67.1	3500	93.8	4700	126	7600	204	7600	204						
80	5.5	3200	85.9	4500	120.6	5800	156	7600	204								
100	6.9	3800	102	5400	144.7	6500	174	7600	204								
125	8.6	4700	126	6500	174.2	6500	174										
psig	bar	Body Size: NPS 1-1/2															
2	0.14	290	7.7	460	12.3	530	14.2	810	21.7	1000	26.8	1300	34.8	1500	40.2	1900	51.0
3	0.21	390	10.4	640	17.2	700	18.7	1000	26.8	1200	32.2	1700	45.6	2400	64.4	2700	72.4
5	0.34	550	14.7	860	23.0	960	25.7	1300	34.8	1800	48.3	2700	72.4	3800	102	4900	132
10	0.69	840	22.5	1100	29.5	1400	37.5	2100	56.3	2800	75.1	4600	123	5600	150	6000	161
15	1.0	1000	26.8	1400	37.5	1800	48.3	2700	72.4	3900	105	5600	150	5600	150	6000	161
20	1.4	1200	32.2	1600	42.9	2100	56.3	3400	91.2	4700	126	5600	150	5600	150	6000	161
30	2.1	1500	40.2	2100	56.3	2800	75.1	4700	126	6300	169	5600	150	5600	150		
40	2.8	1900	51.0	2600	69.7	3300	88.5	5500	148	5600	150	5600	150				
50	3.4	2300	61.7	3100	83.1	3900	105	5500	148	5600	150						
60	4.1	2600	69.7	3600	96.5	4500	121	5500	148	5600	150						
80	5.5	3300	88.5	4500	120.6	5400	145	5500	148								
100	6.9	4000	107	5400	144.7	5500	148	5500	148								
125	8.6	4000	107	6700	179.6	5500	148										
psig	bar	Body Size: NPS 2															
2	0.14	290	7.7	520	13.9	450	12.0	750	20.1	1000	26.8	1300	34.8	1700	45.6	1800	48.3
3	0.21	380	10.2	660	17.7	670	17.9	1000	26.8	1100	29.5	1700	45.6	2100	56.3	2600	69.7
5	0.34	540	14.4	830	22.2	950	25.5	1200	32.2	1700	45.6	2400	64.4	3100	83.2	4300	115
10	0.69	820	22.0	1100	29.5	1400	37.5	2100	56.3	2800	75.1	4500	121	6000	161	8200	220
15	1.0	1000	26.8	1400	37.5	1800	48.3	2700	72.4	3900	105	5700	153	6600	177	8200	220
20	1.4	1100	29.5	1600	42.9	2100	56.3	3400	91.2	4800	129	6000	161	6600	177	8200	220
30	2.1	1500	40.2	2100	56.3	2600	69.7	4200	113	6300	169	6000	161	6600	177		
40	2.8	1900	51.0	2600	69.7	3300	88.5	5700	153	6300	169	6000	161				
50	3.4	2200	59.0	3100	83.1	4000	107	5700	153	6300	169						
60	4.1	2600	69.7	3500	93.8	4500	121	5700	153	6300	169						
80	5.5	3300	88.5	4500	120.6	5500	148	5700	153								
100	6.9	4000	107	5400	144.7	5500	148	5700	153								
125	8.6	4000	107	6500	174.2	5500	148										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

CS400 Series

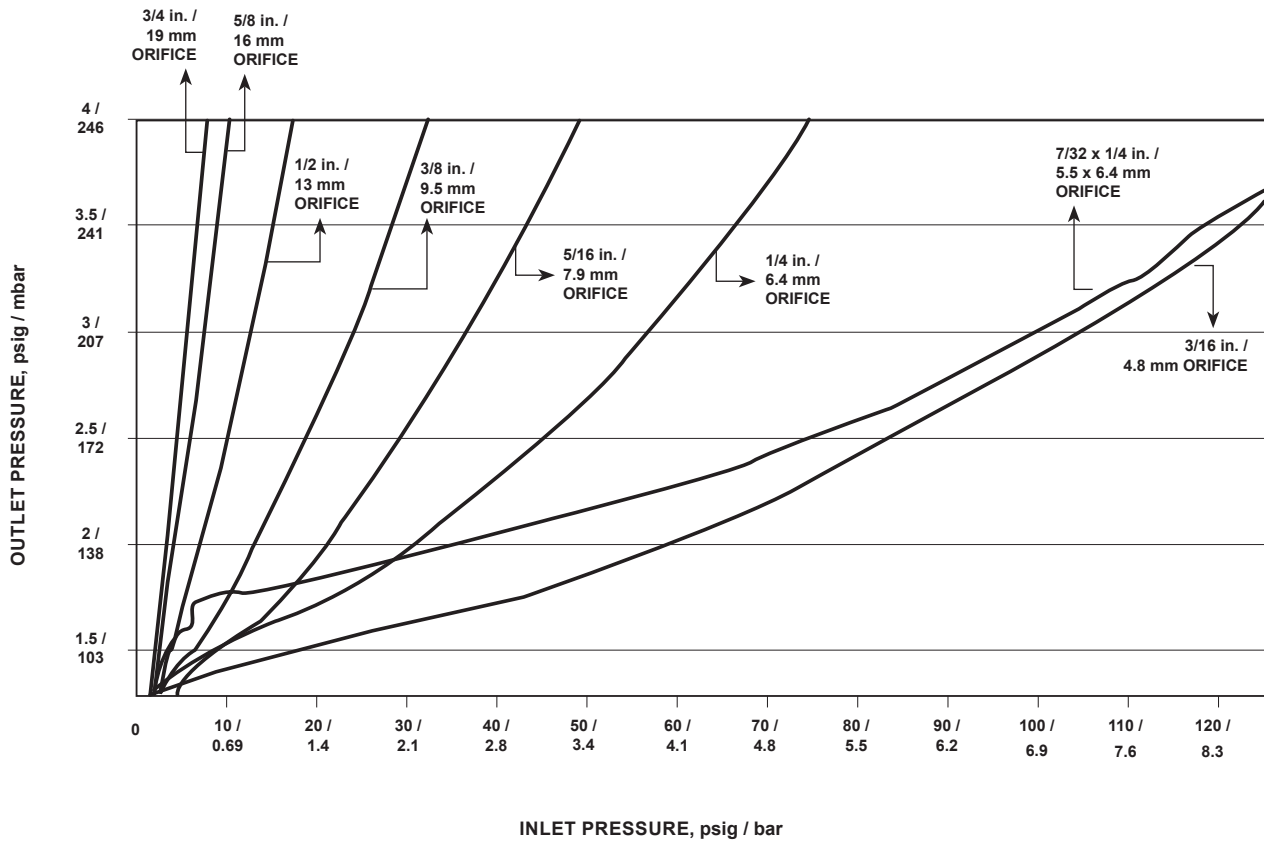


Figure 12. Type CS400IR Relief Curves (Blocked per Orifice Size) at 1 psig / 69 mbar Set Pressure

Table 18. Type CS400 Relief Table, 1 psig / 69 mbar Setpoint, Internal Registration

ORIFICE SIZE		REGULATOR SET PRESSURE		MAXIMUM INLET PRESSURE TO KEEP OUTLET PRESSURE AT/OR BELOW ⁽¹⁾			
				2.5 psig / 172 mbar		3 psig / 207 mbar	
In.	mm	psig	mbar	psig	bar	psig	bar
3/16	4.8	1	69	84	5.8	105	7.2
7/32 x 1/4	5.5 x 6.4			81	5.6	100	6.9
1/4	6.4			46	3.2	56	3.9
5/16	7.9			29	2.0	37	2.6
3/8	9.5			19	1.3	24	1.7

1. Relief values obtained by blocking regulator open per orifice.

Table 19. Type CS400 Internal Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
2 psig	-0.17 psi	0.17 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-12 mbar	12 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4															
psig	bar	260	6.9	400	10.7	290	7.7	590	15.8	810	21.7	740	19.8	750	20.1	890	23.8
3	0.21	480	12.8	770	20.6	710	19.0	630	16.9	850	22.8	1000	26.8	1400	37.5	1600	42.9
5	0.34	630	16.9	890	23.9	900	24.1	1000	26.8	1500	40.2	1900	51.0	2500	67.1	2900	77.8
10	0.69	860	23.0	1200	32.2	1200	32.2	1500	40.2	2200	59.0	2800	75.1	4100	110	4700	126
15	1.0	1000	26.8	1500	40.2	1600	42.9	2100	56.3	2700	72.4	4300	115	5200	140	5600	150
20	1.4	1400	37.5	2000	53.6	2300	61.7	3000	80.5	4500	121	5400	145	5600	150		
30	2.1	1800	48.3	2500	67.0	3200	85.9	4400	118	5400	145	5400	145				
40	2.8	2200	59.0	3000	80.4	3800	102	5300	142	5400	145						
50	3.4	2600	69.7	3400	91.1	4400	118	5300	142	5400	145						
60	4.1	3200	85.9	4400	117.9	4400	118	5300	142								
80	5.5	3700	99.3	5300	142.0	4400	118	5300	142								
100	6.9	3700	99.3	5700	152.8	4400	118										
125	8.6																
		Body Size: NPS 1-1/2															
psig	bar	220	5.9	370	9.9	330	8.8	640	17.1	760	20.4	670	17.9	830	22.2	910	24.4
3	0.21	410	11.0	740	19.8	740	19.8	650	17.4	800	21.4	1000	26.8	1300	34.8	1500	40.2
5	0.34	600	16.1	850	22.8	890	23.8	1000	26.8	1500	40.2	2000	53.6	2400	64.4	3200	85.9
10	0.69	810	21.7	1200	32.2	1100	29.5	1400	37.5	2000	53.6	2700	72.4	4600	123	5600	150
15	1.0	1000	26.8	1500	40.2	1500	40.2	1800	48.3	2900	77.8	4000	107	5200	140	5600	150
20	1.4	1400	37.5	2000	53.6	2100	56.3	3100	83.2	4600	123	5400	145	5600	150		
30	2.1	1700	45.6	2500	67.0	2900	77.8	4800	129	5400	145	5400	145				
40	2.8	2100	56.3	3000	80.4	3800	102	5300	142	5400	145						
50	3.4	2400	64.4	3500	93.8	4500	121	5300	142	5400	145						
60	4.1	3100	83.2	4400	117.9	4500	121	5300	142								
80	5.5	3700	99.3	5400	144.7	4500	121	5300	142								
100	6.9	3700	99.3	6400	171.5	4500	121										
125	8.6																
		Body Size: NPS 2															
psig	bar	220	5.9	390	10.5	360	9.6	570	15.3	800	21.4	620	16.6	760	20.4	830	22.2
3	0.21	360	9.6	690	18.5	710	19.0	570	15.3	780	20.9	1000	26.8	1200	32.2	1400	37.5
5	0.34	560	15.0	870	23.3	890	23.8	920	24.6	1400	37.5	1900	51.0	2300	61.7	2900	77.8
10	0.69	860	23.0	1100	29.5	1100	29.5	1300	34.8	2000	53.6	2800	75.1	3700	99.3	3900	105
15	1.0	1000	26.8	1400	37.5	1400	37.5	1700	45.6	2600	69.7	3700	99.3	5200	140	5600	150
20	1.4	1300	34.8	1900	50.9	2000	53.6	2400	64.4	4000	107	5400	145	5600	150		
30	2.1	1700	45.6	2500	67.0	2900	77.8	3900	105	5400	145	5400	145				
40	2.8	2100	56.3	3000	80.4	3600	96.6	4300	115	5400	145						
50	3.4	2500	67.1	3400	91.1	4200	113	5400	145	5400	145						
60	4.1	3100	83.2	4400	117.9	5400	145	5400	145								
80	5.5	3800	102	5400	144.7	5400	145	5400	145								
100	6.9	3800	102	6500	174.2	5400	145										
125	8.6																

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 20. Type CS400 Internal Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
2 psig	-0.33 psi	0.33 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-23 mbar	23 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4															
psig	bar																
3	0.21	330	8.8	580	15.5	430	11.5	770	20.6	1000	26.8	1200	32.2	1400	37.5	1500	40.2
5	0.34	540	14.4	820	22.0	830	22.2	1000	26.8	1300	34.8	1700	45.6	2400	64.4	2900	77.8
10	0.69	810	21.7	1100	29.5	1200	32.2	1800	48.3	2300	61.7	3100	83.2	4300	115	5600	150
15	1.0	990	26.5	1400	37.5	1700	45.6	2300	61.7	3300	88.5	4200	113	6100	164	6200	166
20	1.4	1200	32.2	1600	42.9	2100	56.3	3000	80.5	3900	105	6000	161	6100	164	6200	166
30	2.1	1500	40.2	2100	56.3	2700	72.4	4200	113	5900	158	6000	161	6100	164		
40	2.8	1800	48.3	2600	69.7	3400	91.2	5300	142	5900	158	6000	161				
50	3.4	2200	59.0	3000	80.4	3900	105	5300	142	5900	158						
60	4.1	2600	69.7	3500	93.8	5000	134	5300	142	5900	158						
80	5.5	3300	88.5	4400	117.9	5000	134	5300	142								
100	6.9	4000	107	5400	144.7	5000	134	5300	142								
125	8.6	4000	107	6500	174.2	5000	134										
		Body Size: NPS 1-1/2															
psig	bar																
3	0.21	290	7.7	490	13.1	540	14.4	840	22.5	1000	26.8	1100	29.5	1500	40.2	1700	45.6
5	0.34	510	13.6	790	21.2	840	22.5	1000	26.8	1300	34.8	1800	48.3	2300	61.7	2900	77.8
10	0.69	770	20.6	1090	29.2	1200	32.2	1700	45.6	2400	64.4	3200	85.9	4800	129	6200	166
15	1.0	990	26.5	1300	34.8	1700	45.6	2300	61.7	3200	85.9	5100	137	6400	172	6700	180
20	1.4	1100	29.5	1600	42.9	2100	56.3	2800	75.1	4200	113	6000	161	6400	172	6700	180
30	2.1	1500	40.2	2100	56.3	2800	75.1	4500	121	5900	158	6000	161	6400	172		
40	2.8	1900	51.0	2600	69.7	3300	88.5	5600	150	5900	158	6000	161				
50	3.4	2200	59.0	3000	80.4	3900	105	5600	150	5900	158						
60	4.1	2500	67.1	3600	96.5	4500	121	5600	150	5900	158						
80	5.5	3300	88.5	4500	120.6	5100	137	5600	150								
100	6.9	3900	105	5400	144.7	5100	137	5600	150								
125	8.6	4000	107	6600	176.9	5100	137										
		Body Size: NPS 2															
psig	bar																
3	0.21	290	7.7	580	15.5	530	14.2	800	21.4	1000	26.8	1100	29.5	1400	37.5	1600	42.9
5	0.34	490	13.1	770	20.6	850	22.8	970	26.0	1300	34.8	1800	48.3	2300	61.7	2800	75.1
10	0.69	750	20.1	1110	29.7	1300	34.8	1600	42.9	2400	64.4	3200	85.9	4200	113	4800	129
15	1.0	1000	26.8	1300	34.8	1600	42.9	2200	59.0	3000	80.5	4500	121	6200	166	6000	161
20	1.4	1100	29.5	1600	42.9	1900	51.0	2800	75.1	3900	105	5900	158	6000	161	6000	161
30	2.1	1500	40.2	2000	53.6	2700	72.4	3700	99.3	5700	153	5900	158	6000	161		
40	2.8	1900	51.0	2600	69.7	3300	88.5	5100	137	5900	158	5900	158				
50	3.4	2200	59.0	3100	83.1	4000	107	5500	148	5900	158						
60	4.1	2600	69.7	3500	93.8	4600	123	5500	148	5900	158						
80	5.5	3200	85.9	4500	120.6	4600	123	5500	148								
100	6.9	4000	107	5500	147.4	4600	123	5500	148								
125	8.6	4000	107	6600	176.9	4600	123										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 21. Type CS400 Internal Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
2 psig	-0.2 psi	0.2 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-14 mbar	14 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4															
psig	bar																
3	0.21	270	7.2	440	11.8	330	8.8	630	16.9	850	22.8	860	23.0	870	23.3	1000	26.8
5	0.34	500	13.4	780	20.9	740	19.8	730	19.5	1000	26.8	1200	32.2	1600	42.9	1900	51.0
10	0.69	680	18.2	970	26.0	1000	26.8	1100	29.5	1700	45.6	2200	59.0	2900	77.8	3400	91.2
15	1.0	640	17.1	1300	34.8	1300	34.8	1700	45.6	2500	67.1	3200	85.9	4600	123	5300	142
20	1.4	1100	29.5	1500	40.2	1700	45.6	2300	61.7	3000	80.5	4800	129	6300	169	6300	169
30	2.1	1100	29.5	2000	53.6	2500	67.1	3400	91.2	4900	132	6300	169	6300	169		
40	2.8	1600	42.9	2500	67.0	3300	88.5	4700	126	6000	161	6300	169				
50	3.4	2000	53.6	3000	80.4	3800	102	5500	148	6000	161						
60	4.1	2400	64.4	3500	93.8	4500	121	5500	148	6000	161						
80	5.5	3100	83.2	4400	117.9	5400	145	5500	148								
100	6.9	3800	102	5400	144.7	5400	145	5500	148								
125	8.6	3800	102	6000	160.8	5400	145										
		Body Size: NPS 1-1/2															
psig	bar																
3	0.21	230	6.1	400	10.7	370	9.9	690	18.5	900	24.1	770	20.6	940	25.2	1000	26.8
5	0.34	450	12.0	750	20.1	770	20.6	730	19.5	960	25.7	1200	32.2	1500	40.2	1800	48.3
10	0.69	670	17.9	950	25.5	990	26.5	1100	29.5	1700	45.6	2300	61.7	3100	83.2	4100	110
15	1.0	890	23.8	1200	32.2	1300	34.8	1600	42.9	2300	61.7	3400	91.2	5300	142	6300	169
20	1.4	1000	26.8	1500	40.2	1700	45.6	2100	56.3	3300	88.5	4600	123	6300	169	6300	169
30	2.1	1500	40.2	2000	53.6	2400	64.4	3600	96.6	5200	140	6300	169	6300	169		
40	2.8	1800	48.3	2500	67.0	3100	83.2	5100	137	6300	169	6300	169				
50	3.4	2100	56.3	3000	80.4	3800	102	6100	164	6300	169						
60	4.1	2400	64.4	3500	93.8	4500	121	6100	164	6300	169						
80	5.5	3100	83.2	4500	120.6	5400	145	6100	164								
100	6.9	3800	102	5400	144.7	5400	145	6100	164								
125	8.6	3800	102	6500	174.2	5400	145										
		Body Size: NPS 2															
psig	bar																
3	0.21	240	6.4	430	11.5	390	10.4	600	16.1	860	23.0	730	19.5	1000	26.8	1000	26.8
5	0.34	440	11.8	720	19.3	740	19.8	690	18.5	910	24.4	1200	32.2	1500	40.2	1700	45.6
10	0.69	640	17.1	970	26.0	990	26.5	1000	26.8	1600	42.9	2200	59.0	2700	72.4	3300	88.5
15	1.0	930	24.9	1200	32.2	1200	32.2	1500	40.2	2300	61.7	3100	83.2	4200	113	4600	123
20	1.4	1100	29.5	1400	37.5	1500	40.2	1900	51.0	2900	77.8	4100	110	6000	161	6000	161
30	2.1	1400	37.5	1900	50.9	2300	61.7	2800	75.1	4400	118	6000	161	6000	161		
40	2.8	1700	45.6	2500	67.0	3100	83.2	4200	113	6000	161	6000	161				
50	3.4	2200	59.0	3000	80.4	3800	102	4700	126	6000	161						
60	4.1	2500	67.1	3500	93.8	4400	118	6000	161	6000	161						
80	5.5	3100	83.2	4400	117.9	5700	153	6000	161								
100	6.9	3900	105	5400	144.7	5700	153	6000	161								
125	8.6	3900	105	6500	174.2	5700	153										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 22. Type CS400 Internal Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
2 psig	-0.4 psi	0.4 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-28 mbar	28 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm³/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h	SCFH	Nm³/h
psig		Body Size: NPS 1-1/4															
bar		350	9.3	600	16.1	460	12.3	820	22.0	1100	29.5	1300	34.8	1600	42.9	1900	51.0
3	0.21	550	14.7	830	22.2	850	22.8	1100	29.5	1500	40.2	1900	51.0	2600	69.7	3400	91.2
5	0.34	850	22.8	1120	30.0	1300	34.8	1900	51.0	2600	69.7	3400	91.2	4700	126	6200	166
10	0.69	1000	26.8	1400	37.5	1700	45.6	2500	67.1	3600	96.6	4400	118	6200	166	6200	166
15	1.0	1200	32.2	1600	42.9	2100	56.3	3100	83.2	4100	110	6200	166	6200	166	6200	166
20	1.4	1500	40.2	2100	56.3	2700	72.4	4400	118	6000	161	6200	166	6200	166		
30	2.1	1800	48.3	2600	69.7	3400	91.2	5400	145	6000	161	6200	166				
40	2.8	2200	59.0	3000	80.4	4000	107	6000	161	6000	161						
50	3.4	2600	69.7	3500	93.8	4600	123	6000	161	6000	161						
60	4.1	3300	88.5	4500	120.6	5800	156	6000	161								
80	5.5	3900	105	5400	144.7	5800	156	6000	161								
100	6.9	3900	105	6600	176.9	5800	156										
125	8.6																
psig		Body Size: NPS 1-1/2															
bar		310	8.3	520	13.9	570	15.3	900	24.1	1100	29.5	1300	34.8	1700	45.6	1900	51.0
3	0.21	520	13.9	800	21.4	880	23.6	1100	29.5	1500	40.2	2000	53.6	2600	69.7	3300	88.5
5	0.34	800	21.4	1110	29.7	1300	34.8	1900	51.0	2500	67.1	3400	91.2	5300	142	6700	180
10	0.69	1000	26.8	1400	37.5	1800	48.3	2500	67.1	3600	96.6	5400	145	6400	172	6700	180
15	1.0	1100	29.5	1600	42.9	2100	56.3	3100	83.2	4500	121	6200	166	6400	172	6700	180
20	1.4	1600	42.9	2100	56.3	2800	75.1	4600	123	6200	166	6200	166	6400	172		
30	2.1	1900	51.0	2600	69.7	3300	88.5	5700	153	6200	166	6200	166				
40	2.8	2200	59.0	3000	80.4	3900	105	6000	161	6200	166						
50	3.4	2500	67.1	3600	96.5	4500	121	6000	161	6200	166						
60	4.1	3300	88.5	4500	120.6	5800	156	6000	161								
80	5.5	3900	105	5400	144.7	5800	156	6000	161								
100	6.9	3900	105	6600	176.9	5800	156										
125	8.6																
psig		Body Size: NPS 2															
bar		300	8.0	600	16.1	560	15.0	850	22.8	1100	29.5	1300	34.8	1700	45.6	1900	51.0
3	0.21	500	13.4	790	21.2	890	23.8	1000	26.8	1500	40.2	2100	56.3	2700	72.4	3200	85.9
5	0.34	780	20.9	1130	30.3	1300	34.8	1800	48.3	2600	69.7	3600	96.6	4900	131	5600	150
10	0.69	1000	26.8	1400	37.5	1700	45.6	2400	64.4	3300	88.5	5100	137	6000	161	6000	161
15	1.0	1100	29.5	1600	42.9	2000	53.6	3000	80.5	4200	113	6000	161	6000	161	6000	161
20	1.4	1500	40.2	2100	56.3	2700	72.4	3900	105	6000	161	6000	161	6000	161		
30	2.1	1900	51.0	2600	69.7	3300	88.5	5400	145	6000	161	6000	161				
40	2.8	2200	59.0	3100	83.1	4000	107	5800	156	6000	161						
50	3.4	2600	69.7	3500	93.8	4600	123	5800	156	6000	161						
60	4.1	3300	88.5	4500	120.6	5800	156	5800	156								
80	5.5	4100	110	5400	144.7	5800	156	5800	156								
100	6.9	4100	110	6600	176.9	5800	156										
125	8.6																

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

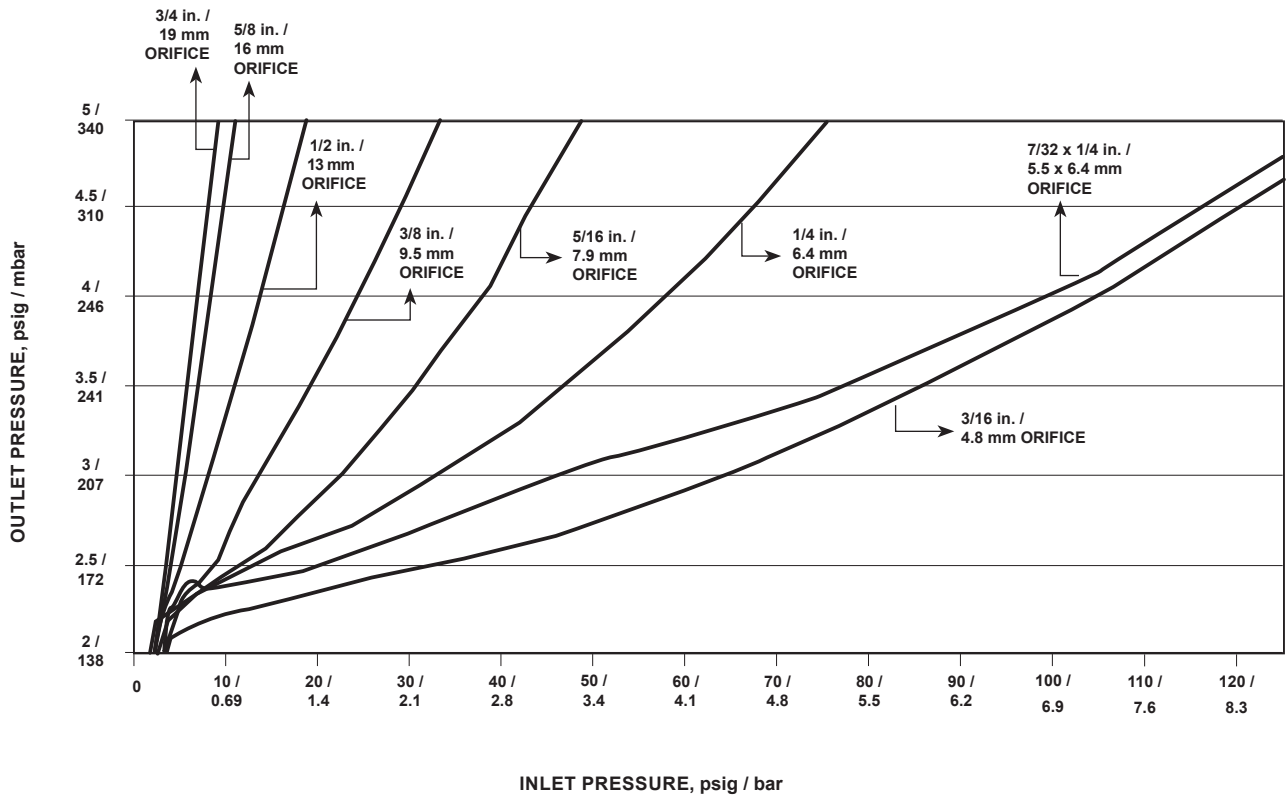


Figure 13. Type CS400IR Relief Curves (Blocked per Orifice Size) at 2 psig / 138 mbar Set Pressure

Table 23. Type CS400 Relief Table, 2 psig / 138 mbar Setpoint, Internal Registration

ORIFICE SIZE		REGULATOR SET PRESSURE		MAXIMUM INLET PRESSURE TO KEEP OUTLET PRESSURE AT/OR BELOW ⁽¹⁾			
				3 psig / 207 mbar		4 psig / 276 mbar	
In.	mm	psig	mbar	psig	bar	psig	bar
3/16	4.8	2	138	64	4.4	105	7.2
7/32 x 1/4	5.5 x 6.4			43	3.0	95	6.5
1/4	6.4			32	2.2	58	4.0
5/16	7.9			23	1.6	37	2.6
3/8	9.5			14	0.97	24	1.7

1. Relief values obtained by blocking regulator open per orifice.

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Table 24. Type CS400 Internal Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
5 psig	-0.20 psi	0.20 psi	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-14 mbar	14 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4															
10	0.69	460	12.3	400	10.7	460	12.3	470	12.6	630	16.9	800	21.4	970	26.0	1100	29.5
15	1.0	500	13.4	500	13.4	600	16.1	660	17.7	910	24.4	1200	32.2	1700	45.6	2000	53.6
20	1.4	560	15.0	600	16.1	740	19.8	880	23.6	1200	32.2	1800	48.3	1800	48.3	1800	48.3
30	2.1	860	23.0	800	21.4	910	24.4	1600	42.9	2000	53.6	2400	64.4	3200	85.9		
40	2.8	1100	29.5	1100	29.5	1300	34.8	1800	48.3	2700	72.4	2900	77.8				
50	3.4	1500	40.2	1400	37.5	1900	51.0	2600	69.7	2700	72.4						
60	4.1	1500	40.2	1600	42.9	2100	56.3	3300	88.5	5200	140						
80	5.5	1900	51.0	2500	67.0	3000	80.5	5100	137								
100	6.9	2600	69.7	3100	83.1	4600	123	5100	137								
125	8.6	2600	69.7	3900	104.5	4600	123										
psig	bar	Body Size: NPS 1-1/2															
10	0.69	430	11.5	390	10.5	540	14.4	410	11.0	660	17.7	710	19.0	1500	40.2	920	24.6
15	1.0	500	13.4	500	13.4	520	13.9	590	15.8	930	24.9	1000	26.8	2300	61.7	1600	42.9
20	1.4	580	15.5	600	16.1	700	18.7	770	20.6	1100	29.5	1300	34.8	1900	51.0	1900	51.0
30	2.1	790	21.2	900	24.1	970	26.0	1100	29.5	1500	40.2	2200	59.0	2500	67.1		
40	2.8	950	25.5	1200	32.2	1200	32.2	1400	37.5	2000	53.6	2500	67.1				
50	3.4	1100	29.5	1400	37.5	1500	40.2	1800	48.3	2500	67.1						
60	4.1	1400	37.5	1700	45.6	1700	45.6	2200	59.0	3700	99.3						
80	5.5	1800	48.3	2600	69.7	2400	64.4	3100	83.2								
100	6.9	2300	61.7	3600	96.5	4000	107	4300	115								
125	8.6	3000	80.5	4800	128.6	4600	123										
psig	bar	Body Size: NPS 2															
10	0.69	350	9.3	400	10.7	510	13.6	360	9.6	570	15.3	780	20.9	910	24.4	1000	26.8
15	1.0	490	13.1	500	13.4	550	14.7	560	15.0	740	19.8	1000	26.8	1300	34.8	1400	37.5
20	1.4	640	17.1	600	16.1	700	18.7	710	19.0	1000	26.8	1300	34.8	1600	42.9	1800	48.3
30	2.1	830	22.2	800	21.4	960	25.7	1000	26.8	1400	37.5	2500	67.1	3300	88.5		
40	2.8	1000	26.8	1000	26.8	1200	32.2	1200	32.2	2200	59.0	3500	93.9				
50	3.4	1100	29.5	1300	34.8	1500	40.2	1600	42.9	2300	61.7						
60	4.1	1400	37.5	1600	42.9	1600	42.9	2100	56.3	2600	69.7						
80	5.5	2300	61.7	2000	53.6	2700	72.4	2700	72.4								
100	6.9	2500	67.1	2800	75.0	3800	102	3900	105								
125	8.6	3200	85.9	4200	112.6	4800	129										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 25. Type CS400 Internal Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
5 psig	-0.39 psi	0.39 psi	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-27 mbar	27 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4															
10	0.69	560	15.0	640	17.2	720	19.3	840	22.5	1100	29.5	1400	37.5	970	26.0	2000	53.6
15	1.0	700	18.7	900	24.1	980	26.3	1200	32.2	1600	42.9	2300	61.7	3100	83.2	3500	93.9
20	1.4	910	24.4	1000	26.8	1200	32.2	1500	40.2	2100	56.3	3100	83.2	3100	83.2	3700	99.3
30	2.1	1300	34.8	1400	37.5	1700	45.6	2600	69.7	3200	85.9	3200	85.9	3200	85.9		
40	2.8	1700	45.6	1900	50.9	2300	61.7	3300	88.5	4700	126	5200	140				
50	3.4	2100	56.3	2400	64.3	3200	85.9	4300	115	5200	140						
60	4.1	2300	61.7	2800	75.0	3700	99.3	5200	140	5200	140						
80	5.5	2900	77.8	3700	99.2	4900	132	5200	140								
100	6.9	3900	105	4900	131.3	5200	140	5200	140								
125	8.6	4500	121	6100	163.5	5200	140										
psig	bar	Body Size: NPS 1-1/2 - External															
10	0.69	580	15.5	620	16.6	770	20.6	770	20.6	1100	29.5	1300	34.8	1700	45.6	1800	48.3
15	1.0	710	19.0	900	24.1	900	24.1	1100	29.5	1600	42.9	2000	53.6	2700	72.4	2800	75.1
20	1.4	870	23.3	1100	29.5	1200	32.2	1500	40.2	2000	53.6	2500	67.1	3500	93.9	4300	115
30	2.1	1200	32.2	1500	40.2	1600	42.9	2000	53.6	3000	80.5	3800	102	5200	140		
40	2.8	1500	40.2	2000	53.6	2100	56.3	2700	72.4	4200	113	5200	140				
50	3.4	1900	51.0	2600	69.7	2600	69.7	3500	93.9	5200	140						
60	4.1	2300	61.7	3000	80.4	3200	85.9	5000	134	5200	140						
80	5.5	3000	80.5	4100	109.9	4700	126	5000	134								
100	6.9	3600	96.6	5200	139.4	5000	134	5000	134								
125	8.6	4500	121	6200	166.2	5000	134										
psig	bar	Body Size: NPS 2															
10	0.69	550	14.7	640	17.2	760	20.4	690	18.5	1000	26.8	1400	37.5	1700	45.6	1800	48.3
15	1.0	720	19.3	900	24.1	920	24.6	980	26.3	1400	37.5	1900	51.0	2500	67.1	2600	69.7
20	1.4	920	24.6	1100	29.5	1100	29.5	1200	32.2	1800	48.3	2400	64.4	3400	91.2	3800	102
30	2.1	1200	32.2	1400	37.5	1700	45.6	1900	51.0	2700	72.4	4300	115	5200	140		
40	2.8	1600	42.9	1900	50.9	2400	64.4	2400	64.4	4300	115	5200	140				
50	3.4	1900	51.0	2400	64.3	2700	72.4	3100	83.2	4900	132						
60	4.1	2200	59.0	2800	75.0	3000	80.5	4200	113	5200	140						
80	5.5	3200	85.9	4000	107.2	4600	123	5200	140								
100	6.9	3700	99.3	5100	136.7	5000	134	5200	140								
125	8.6	4700	126	6200	166.2	5000	134										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

CS400 Series

Table 26. Type CS400 Internal Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
5 psig	-0.5 psi	0.5 psi	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-34 mbar	34 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4															
10	0.69	610	16.3	740	19.8	850	22.8	1000	26.8	1300	34.8	1800	48.3	2200	59.0	2500	67.1
15	1.0	780	20.9	1000	26.8	1200	32.2	1400	37.5	1900	51.0	2900	77.8	3700	99.3	4500	121
20	1.4	1000	26.8	1200	32.2	1500	40.2	1900	51.0	2600	69.7	3800	102	4600	123	4700	126
30	2.1	1300	34.8	1700	45.6	2000	53.6	3100	83.2	3900	105	5500	148	5500	148		
40	2.8	1800	48.3	2300	61.6	2800	75.1	3900	105	5500	148	5500	148				
50	3.4	2100	56.3	2800	75.0	3800	102	5000	134	5500	148						
60	4.1	2500	67.1	3200	85.8	4100	110	5400	145	5500	148						
80	5.5	3000	80.5	4200	112.6	5400	145	5400	145								
100	6.9	4000	107	5300	142.0	5400	145	5400	145								
125	8.6	4000	107	6400	171.5	5400	145										
psig	bar	Body Size: NPS 1-1/2															
10	0.69	640	17.1	710	19.0	900	24.1	960	25.7	1300	34.8	1600	42.9	2200	59.0	2200	59.0
15	1.0	790	21.2	1000	26.8	1000	26.8	1400	37.5	2000	53.6	2500	67.1	3500	93.9	3600	96.6
20	1.4	970	26.0	1300	34.8	1400	37.5	1800	48.3	2500	67.1	3300	88.5	4400	118	5400	145
30	2.1	1400	37.5	1800	48.2	1900	51.0	2600	69.7	3800	102	5300	142	5500	148		
40	2.8	1600	42.9	2300	61.6	2500	67.1	3300	88.5	5100	137	5500	148				
50	3.4	2100	56.3	2800	75.0	3200	85.9	4200	113	5500	148						
60	4.1	2500	67.1	3300	88.4	3900	105	5500	148	5500	148						
80	5.5	3300	88.5	4300	115.2	5200	140	5500	148								
100	6.9	3700	99.3	5300	142.0	5500	148	5500	148								
125	8.6	4300	115	6300	168.8	5500	148										
psig	bar	Body Size: NPS 2															
10	0.69	620	16.6	760	20.4	910	24.4	890	23.8	1300	34.8	1600	42.9	2100	56.3	2400	64.4
15	1.0	800	21.4	1000	26.8	1100	29.5	1300	34.8	1800	48.3	2400	64.4	3200	85.9	3400	91.2
20	1.4	1000	26.8	1300	34.8	1400	37.5	1600	42.9	2300	61.7	3100	83.2	4200	113	5000	134
30	2.1	1400	37.5	1700	45.6	2000	53.6	2400	64.4	3400	91.2	5200	140	5500	148		
40	2.8	1800	48.3	2300	61.6	2700	72.4	3200	85.9	4900	132	5500	148				
50	3.4	2100	56.3	2800	75.0	3100	83.2	4000	107	5500	148						
60	4.1	2500	67.1	3300	88.4	3600	96.6	5000	134	5500	148						
80	5.5	3200	85.9	4300	115.2	5000	134	5500	148								
100	6.9	3900	105	5300	142.0	5500	148	5500	148								
125	8.6	4500	121	6400	171.5	5500	148										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 27. Type CS400 Internal Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 20% Accuracy

		ACCURACY			
SETPOINT	+ / - 20%		SET RANGE	PART NUMBER / COLOR	
5 psig	-1 psig	1 psig	2 to 5.5 psig	GE30197X012 / Yellow	
345 mbar	-69 mbar	69 mbar	138 to 380 mbar		

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS																	
Inlet Pressure		Orifice Size, In. / mm															
		3/16	4.8	7/32 x 1/4	5.5 x 6.4	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4															
10	0.69	720	19.3	1000	26.8	1200	32.2	1700	45.6	2200	59.0	3000	80.5	3900	105	4700	126
15	1.0	960	25.7	1300	34.8	1700	45.6	2400	64.4	3100	83.2	4700	126	6200	166	7000	188
20	1.4	1100	29.5	1500	40.2	2000	53.6	3000	80.5	4000	107	6000	161	6500	174	7000	188
30	2.1	1400	37.5	2000	53.6	2700	72.4	4500	121	5800	156	6500	174	6500	174		
40	2.8	1900	51.0	2600	69.7	3400	91.2	5500	148	6500	174	6500	174				
50	3.4	2200	59.0	3000	80.4	4100	110	6500	174	6500	174						
60	4.1	2600	69.7	3500	93.8	4600	123	6500	174	6500	174						
80	5.5	3200	85.9	4500	120.6	5700	153	6500	174								
100	6.9	4000	107	5400	144.7	5700	153	6500	174								
125	8.6	4200	113	6500	174.2	5700	153										
psig	bar	Body Size: NPS 1-1/2															
10	0.69	750	20.1	1000	26.8	1200	32.2	1600	42.9	2300	61.7	2900	77.8	3900	105	4400	118
15	1.0	990	26.5	1300	34.8	1500	40.2	2300	61.7	3200	85.9	4200	113	6100	164	7200	193
20	1.4	1100	29.5	1600	42.9	2000	53.6	2800	75.1	4000	107	5900	158	6600	177	7200	193
30	2.1	1600	42.9	2000	53.6	2600	69.7	4200	113	5900	158	6500	174	6600	177		
40	2.8	1900	51.0	2500	67.0	3300	88.5	5200	140	6500	174	6500	174				
50	3.4	2200	59.0	3000	80.4	3800	102	6200	166	6500	174						
60	4.1	2600	69.7	3500	93.8	4500	121	6200	166	6500	174						
80	5.5	3300	88.5	4400	117.9	5700	153	6200	166								
100	6.9	4100	110	5400	144.7	5700	153	6200	166								
125	8.6	4500	121	6600	176.9	5700	153										
psig	bar	Body Size: NPS 2															
10	0.69	720	19.3	1100	29.5	1200	32.2	1500	40.2	2200	59.0	3000	80.5	3800	102	4700	126
15	1.0	970	26.0	1400	37.5	1600	42.9	2200	59.0	3200	85.9	4400	118	5700	153	6600	177
20	1.4	1100	29.5	1600	42.9	2000	53.6	2900	77.8	3900	105	5200	140	6800	183	7200	193
30	2.1	1500	40.2	2000	53.6	2700	72.4	4000	107	5400	145	6500	174	6800	183		
40	2.8	1900	51.0	2600	69.7	3200	85.9	5000	134	6500	174	6500	174				
50	3.4	2200	59.0	3100	83.1	3800	102	5900	158	6500	174						
60	4.1	2600	69.7	3500	93.8	4300	115	6200	166	6500	174						
80	5.5	3300	88.5	4500	120.6	5900	158	6200	166								
100	6.9	4000	107	5400	144.7	5900	158	6200	166								
125	8.6	4900	132	6600	176.9	5900	158										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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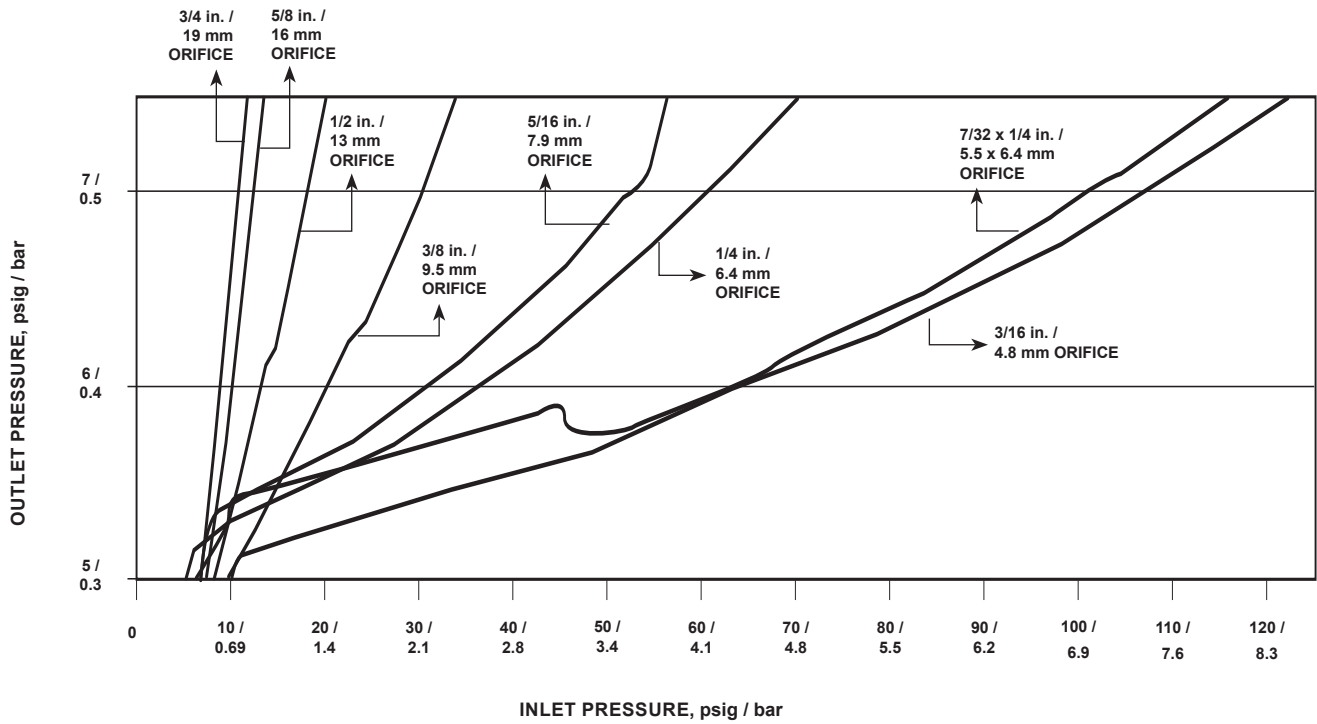


Figure 14. Type CS400IR Relief Curves (Blocked per Orifice Size) at 5 psig / 345 mbar Set Pressure

Table 28. Type CS400 Relief Table, 5 psig / 345 mbar Setpoint, Internal Registration

ORIFICE SIZE		REGULATOR SET PRESSURE		MAXIMUM INLET PRESSURE TO KEEP OUTLET PRESSURE AT/OR BELOW ⁽¹⁾			
				6 psig / 414 mbar		7 psig / 483 mbar	
In.	mm	psig	mbar	psig	bar	psig	bar
3/16	4.8	5	345	63	4.3	106	7.3
7/32 x 1/4	5.5 x 6.4			60	4.1	95	6.5
1/4	6.4			36	2.5	61	4.2
5/16	7.9			31	2.1	53	3.7
3/8	9.5			20	1.4	29	2.0

1. Relief values obtained by blocking regulator open per orifice.

Table 29. Type CS400 External Registration Flow Capacities for 7 in. w.c. / 17 mbar Setpoint

SETPPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	Drop	Boost		
7 in. w.c.	-1 in. w.c.	2 in. w.c.	6 to 8 in. w.c.	GE30188X012 / Gold
17 mbar	-2 mbar	5 mbar	15 to 20 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
0.5	0.03	140	3.7	200	5.3	230	6.1	280	7.5	360	9.6	410	11.0	430	11.5
1	0.07	180	4.8	260	6.9	300	8.0	360	9.6	360	9.6	610	16.3	760	20.4
2	0.14	210	5.6	350	9.3	360	9.6	360	9.6	360	9.6	910	24.4	980	26.3
3	0.21	210	5.6	450	12.0	510	13.6	510	13.6	510	13.6	990	26.5	1060	28.4
5	0.34	210	5.6	590	15.8	610	16.3	870	23.3	1120	30.0	1360	36.5	1920	51.5
10	0.69	210	5.6	680	18.2	970	26.0	1180	31.6	1430	38.3	2000	53.6	2500	67.1
15	1.0	210	5.6	1060	28.4	1150	30.8	1440	38.6	1720	46.1	2100	56.3	2700	72.4
20	1.4	980	26.3	1220	32.7	1390	37.3	1550	41.6	1550	41.6	2500	67.1	3300	88.5
30	2.1	1230	33.0	1450	38.9	1700	45.6	1800	48.3	1880	50.4	2600	69.7		
40	2.8	1400	37.5	1450	38.9	1730	46.4	1880	50.4	2300	61.7				
50	3.4	1450	38.9	1450	38.9	1860	49.9	2000	53.6						
60	4.1	1450	38.9	1450	38.9	2000	53.6	2300	61.7						
80	5.5	1450	38.9	1450	38.9	2500	67.1								
100	6.9	1450	38.9	1450	38.9	2900	77.8								
125	8.6	1450	38.9	1450	38.9										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 30. Type CS400 External Registration Flow Capacities for 11 in. w.c. / 27 mbar Setpoint

SETPPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	Drop	Boost		
11 in. w.c.	-2 in. w.c.	2 in. w.c.	7.5 to 11 in. w.c.	GE30189X012 / Blue
27 mbar	-5 mbar	5 mbar	19 to 27 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
0.5	0.03	130	3.4	170	4.5	240	6.4	290	7.7	350	9.3	350	9.3	350	9.3
1	0.07	160	4.2	350	9.3	380	10.2	520	13.9	690	18.5	890	23.8	1040	27.9
2	0.14	280	7.5	470	12.6	600	16.1	840	22.5	1050	28.1	1330	35.7	1530	41.0
3	0.21	370	9.9	600	16.1	760	20.4	1060	28.4	1380	37.0	1390	37.3	1950	52.3
5	0.34	500	13.4	810	21.7	1380	37.0	1900	51.0	1950	52.3	2000	53.6	2400	64.4
10	0.69	760	20.4	1330	35.7	1480	39.7	2100	56.3	2700	72.4	3600	96.6	3800	102
15	1.0	840	22.5	1790	48.0	1960	52.6	2700	72.4	3500	93.9	4900	132	6600	177
20	1.4	1180	31.6	1990	53.4	2500	67.1	3800	102	4900	132	7100	191	7300	196
30	2.1	1500	40.2	2400	64.4	3300	88.5	5100	137	7900	212	10,700	287		
40	2.8	1880	50.4	3100	83.2	4700	126	6200	166	9700	260				
50	3.4	2200	59.0	3900	105	5700	153	8200	220						
60	4.1	2500	67.1	4600	123	6500	174	9900	266						
80	5.5	3300	88.5	6000	161	7000	188								
100	6.9	4000	107	7000	188	7000	188								
125	8.6	4700	126	8600	231										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 31. Type CS400 External Registration Flow Capacities for 14 in. w.c. / 35 mbar Setpoint

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	Droop	Boost		
14 in. w.c.	-2 in. w.c.	2 in. w.c.	10 to 14 in. w.c.	GE30224X012 / Unpainted
35 mbar	-5 mbar	5 mbar	25 to 35 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
1	0.07	170	4.5	260	6.9	370	9.9	490	13.1	610	16.3	820	22.0	840	22.5
2	0.14	270	7.2	450	12.0	600	16.1	810	21.7	1040	27.9	1180	31.6	1520	40.8
3	0.21	350	9.3	570	15.3	750	20.1	970	26.0	1610	43.2	1650	44.2	1730	46.4
5	0.34	480	12.8	760	20.4	1310	35.1	1330	35.7	1630	43.7	2300	61.7	2300	61.7
10	0.69	760	20.4	1380	37.0	1670	44.8	2100	56.3	2600	69.7	3500	93.9	3900	105
15	1.0	970	26.0	1650	44.2	1940	52.0	2500	67.1	3900	105	5000	134	5100	137
20	1.4	1170	31.4	1760	47.2	2300	61.7	3200	85.9	4200	113	6100	164	6500	174
30	2.1	1500	40.2	2400	64.4	3300	88.5	4200	113	6400	172	10,300	277		
40	2.8	1830	49.1	3200	85.9	4000	107	5900	158	10,900	293				
50	3.4	2200	59.0	3700	99.3	5200	140	8200	220						
60	4.1	2500	67.1	4500	121	6200	166	8700	234						
80	5.5	3300	88.5	5400	145	9100	244								
100	6.9	4000	107	6700	180	11,200	301								
125	8.6	4600	123	8100	217										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 32. Type CS400 External Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
1 psig	-0.16 psi	0.16 psi	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-11 mbar	11 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
2	0.14	240	6.4	320	8.5	350	9.3	350	9.3	350	9.3	350	9.3	350	9.3
3	0.21	310	8.3	360	9.6	420	11.2	420	11.2	420	11.2	960	25.7	1130	30.3
5	0.34	360	9.6	360	9.6	550	14.7	550	14.7	1050	28.1	1400	37.5	1430	38.3
10	0.69	360	9.6	360	9.6	1060	28.4	1420	38.1	1770	47.5	2100	56.3	2100	56.3
15	1.0	480	12.8	940	25.2	1370	36.7	1700	45.6	2200	59.0	2500	67.1	2700	72.4
20	1.4	940	25.2	950	25.5	1670	44.8	2000	53.6	2700	72.4	2900	77.8	2900	77.8
30	2.1	1280	34.3	1280	34.3	2000	53.6	2700	72.4	3300	89	3900	105		
40	2.8	1590	42.6	1590	42.6	2600	69.7	3400	91.2	4200	113				
50	3.4	1830	49.1	1950	52.3	3000	80.5	3600	96.6						
60	4.1	1990	53.4	1990	53.4	3300	88.5	3900	105						
80	5.5	2300	61.7	2300	61.7	4000	107								
100	6.9	2700	72.4	2700	72.4	4400	118								
125	8.6	3200	85.9	3200	85.9										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 33. Type CS400 External Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
1 psig	-0.31 psi	0.31 psi	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-21 mbar	21 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
2	0.14	310	8.3	480	12.8	680	18.2	900	24.1	1290	34.6	1590	42.6	1590	42.6
3	0.21	400	10.7	600	16.1	870	23.3	1100	29.5	1510	40.5	1940	52.0	2100	56.3
5	0.34	530	14.2	820	22.0	1330	35.7	1480	39.7	2000	53.6	2700	72.4	2800	75.1
10	0.69	810	21.7	1310	35.1	1830	49.1	2300	61.7	3300	88.5	4200	113	4600	123
15	1.0	900	24.1	1600	42.9	2300	61.7	2900	77.8	4200	113	5600	150	6100	164
20	1.4	1210	32.4	1910	51.2	2800	75.1	3700	99.3	5200	140	6700	180	7100	191
30	2.1	1580	42.4	2400	64.4	3700	99.3	4900	132	7100	191	9200	247		
40	2.8	1930	51.8	3100	83.2	4700	126	6300	169	9100	244				
50	3.4	2200	59.0	3800	102	5800	156	7300	196						
60	4.1	2600	69.7	4300	115	6600	177	8500	228						
80	5.5	3300	88.5	5400	145	8500	228								
100	6.9	4000	107	6600	177	10,700	287								
125	8.6	4900	132	8100	217										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 34. Type CS400 External Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
1 psig	-0.1 psi	0.1 psi	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-7 mbar	7 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
2	0.14	210	5.6	220	5.9	260	6.9	260	6.9	260	6.9	260	6.9	260	6.9
3	0.21	240	6.4	280	7.5	390	10.4	390	10.4	390	10.4	650	17.4	760	20.4
5	0.34	310	8.3	340	9.1	450	12.0	490	13.1	700	18.7	870	23.3	900	24.1
10	0.69	340	9.1	340	9.1	670	17.9	980	26.3	1130	30.3	1270	34.0	1340	35.9
15	1.0	480	12.8	570	15.3	880	23.6	1090	29.2	1410	37.8	1540	41.3	1760	47.2
20	1.4	660	17.7	660	17.7	1060	28.4	1280	34.3	1670	44.8	1740	46.7	1850	49.6
30	2.1	850	22.8	850	22.8	1330	35.7	1620	43.4	1880	50.4	2200	59.0		
40	2.8	1020	27.3	1020	27.3	1680	45.1	1930	51.8	2200	59.0				
50	3.4	1210	32.4	1210	32.4	1840	49.3	1970	52.8						
60	4.1	1280	34.3	1280	34.3	1920	51.5	2000	53.6						
80	5.5	1430	38.3	1430	38.3	2300	61.7								
100	6.9	1550	41.6	1550	41.6	2700	72.4								
125	8.6	1710	45.9	1710	45.9										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 35. Type CS400 External Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
1 psig	-0.2 psi	0.2 psi	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-14 mbar	14 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4, 1-1/2 and 2													
2	0.14	270	7.2	360	9.6	430	11.5	430	11.5	430	11.5	430	11.5	430	11.5
3	0.21	350	9.3	410	11.0	470	12.6	470	12.6	470	12.6	1200	32.2	1350	36.2
5	0.34	410	11.0	410	11.0	840	22.5	1070	28.7	1330	35.7	1780	47.7	1790	48.0
10	0.69	410	11.0	410	11.0	1310	35.1	1650	44.2	2200	59.0	2600	69.7	2900	77.8
15	1.0	490	13.1	1250	33.5	1670	44.8	2100	56.3	2800	75.1	3500	93.9	3700	99.3
20	1.4	1090	29.2	1480	39.7	2000	53.6	2500	67.1	3500	93.9	4000	107	4100	110
30	2.1	1490	40.0	1940	52.0	2600	69.7	3300	88.5	4400	118	5400	145		
40	2.8	1790	48.0	2500	67.1	3300	88.5	4300	115	5700	153				
50	3.4	2100	56.3	2300	61.7	3900	105	4900	132						
60	4.1	2400	64.4	3300	88.5	4500	121	5200	140						
80	5.5	3100	83.2	3300	88.5	5400	145								
100	6.9	3600	96.6	3700	99.3	6400	172								
125	8.6	4500	121	4500	121										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 36. Type CS400 External Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
2 psig	-0.17 psi	0.17 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-12 mbar	12 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4, 1-1/2 and 2													
3	0.21	250	6.7	310	8.3	420	11.2	550	14.7	680	18.2	910	24.4	1580	42.4
5	0.34	350	9.3	480	12.8	590	15.8	750	20.1	1150	30.8	1150	30.8	1230	33.0
10	0.69	590	15.8	800	21.4	1080	28.9	1170	31.4	1530	41.0	1800	48.3	2400	64.4
15	1.0	700	18.7	1060	28.4	1140	30.6	1550	41.6	2100	56.3	2600	69.7	2900	77.8
20	1.4	960	25.7	1290	34.6	1440	38.6	1910	51.2	2600	69.7	3000	80.5	3000	80.5
30	2.1	1260	33.8	1620	43.4	2000	53.6	2800	75.1	3200	85.9	3700	99.3		
40	2.8	1600	42.9	2200	59.0	2500	67.1	3300	88.5	3900	105				
50	3.4	1810	48.5	2500	67.1	2700	72.4	3600	96.6						
60	4.1	2100	56.3	2700	72.4	3100	83.2	4100	110						
80	5.5	2700	72.4	3400	91.2	3600	96.6								
100	6.9	3000	80.5	3900	105	4100	110								
125	8.6	3500	93.9	4900	132										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 37. Type CS400 External Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
2 psig	-0.33 psi	0.33 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-23 mbar	23 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
3	0.21	320	8.5	460	12.3	660	17.7	880	23.6	1190	31.9	2000	53.6	2400	64.4
5	0.34	460	12.3	750	20.1	1000	26.8	1300	34.8	2200	59.0	2200	59.0	2600	69.7
10	0.69	750	20.1	1170	31.4	1750	46.9	2100	56.3	3000	80.5	3600	96.6	4500	121
15	1.0	990	26.5	1720	46.1	2100	56.3	2800	75.1	3900	105	5200	140	5700	153
20	1.4	1170	31.4	2000	53.6	2500	67.1	3600	96.6	5100	137	6200	166	6600	177
30	2.1	1530	41.0	2500	67.1	3700	99.3	4900	132	6500	174	8000	215		
40	2.8	1870	50.2	3300	88.5	4500	121	6200	166	8000	215				
50	3.4	2200	59.0	3900	105	5100	137	7100	191						
60	4.1	2600	69.7	4300	115	6100	164	8500	228						
80	5.5	3200	85.9	5600	150	8000	215								
100	6.9	3900	105	6800	183	9400	252								
125	8.6	4900	132	8400	226										

☐ – Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 38. Type CS400 External Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
2 psig	-0.2 psi	0.2 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-14 mbar	14 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
3	0.21	280	7.5	340	9.1	470	12.6	620	16.6	800	21.4	1380	37.0	1700	45.6
5	0.34	390	10.4	550	14.7	690	18.5	890	23.8	1380	37.0	1380	37.0	1540	41.3
10	0.69	640	17.1	880	23.6	1230	33.0	1410	37.8	1830	49.1	2200	59.0	2900	77.8
15	1.0	800	21.4	1160	31.1	1370	36.7	1800	48.3	2500	67.1	3200	85.9	3500	93.9
20	1.4	1060	28.4	1490	40.0	1660	44.5	2200	59.0	3100	83.2	3700	99.3	3700	99.3
30	2.1	1430	38.3	1830	49.1	2400	64.4	3300	88.5	3900	105	4800	129		
40	2.8	1730	46.4	2600	69.7	2900	77.8	3900	105	4800	129				
50	3.4	2000	53.6	2900	77.8	3300	88.5	4400	118						
60	4.1	2300	61.7	3200	85.9	3700	99.3	5200	140						
80	5.5	3000	80.5	4100	110	4700	126								
100	6.9	3400	91.2	4700	126	5300	142								
125	8.6	4200	113	5800	156										

☐ – Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 39. Type CS400 External Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
2 psig	-0.4 psi	0.4 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-28 mbar	28 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
3	0.21	330	8.8	540	14.4	720	19.3	990	26.5	1360	36.5	2200	59.0	2600	69.7
5	0.34	500	13.4	800	21.4	1100	29.5	1500	40.2	2500	67.1	2500	67.1	3000	80.5
10	0.69	790	21.2	1270	34.0	1960	52.6	2500	67.1	3400	91.2	4200	113	5400	145
15	1.0	1020	27.3	1760	47.2	2300	61.7	3200	85.9	4500	121	6000	161	6800	183
20	1.4	1180	31.6	2100	56.3	2800	75.1	3900	105	5800	156	7000	188	8000	215
30	2.1	1550	41.6	2600	69.7	4000	107	5500	148	7900	212	9500	255		
40	2.8	1900	51.0	3300	88.5	5000	134	6900	185	9800	263				
50	3.4	2200	59.0	4100	110	5800	156	8200	220						
60	4.1	2600	69.7	4500	121	6800	183	9600	258						
80	5.5	3300	88.5	5800	156	8900	239								
100	6.9	3900	105	7000	188	10,500	282								
125	8.6	4900	132	8700	234										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 40. Type CS400 External Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
5 psig	-0.20 psi	0.20 psi	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-14 mbar	14 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
10	0.69	330	8.8	500	13.4	500	13.4	540	14.4	640	17.1	790	21.2	990	26.5
15	1.0	470	12.6	610	16.3	720	19.3	840	22.5	1030	27.6	1230	33.0	1590	42.6
20	1.4	570	15.3	690	18.5	750	20.1	990	26.5	1250	33.5	1470	39.4	1710	45.9
30	2.1	680	18.2	810	21.7	980	26.3	1150	30.8	1560	41.8	1600	42.9		
40	2.8	680	18.2	1040	27.9	1290	34.6	1660	44.5	1700	45.6				
50	3.4	1070	28.7	1370	36.7	1420	38.1	1590	42.6						
60	4.1	1140	30.6	1310	35.1	1660	44.5	1860	49.9						
80	5.5	1530	41.0	1720	46.1	1840	49.3								
100	6.9	1570	42.1	1750	46.9	1750	46.9								
125	8.6	2000	53.6	2300	61.7										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 41. Type CS400 External Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
5 psig	-0.39 psi	0.39 psi	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-27 mbar	27 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
10	0.69	460	12.3	680	18.2	680	18.2	680	18.2	1400	37.5	1550	41.6	1810	48.5
15	1.0	690	18.5	800	21.4	1370	36.7	1520	40.8	1950	52.3	2300	61.7	2700	72.4
20	1.4	890	23.8	1190	31.9	1370	36.7	1860	49.9	2200	59.0	2700	72.4	3200	85.9
30	2.1	1220	32.7	1590	42.6	1980	53.1	2300	61.7	3000	80.5	3400	91.2		
40	2.8	1500	40.2	1920	51.5	2300	61.7	3200	85.9	3800	102				
50	3.4	1810	48.5	2400	64.4	2700	72.4	3400	91.2						
60	4.1	2000	53.6	2600	69.7	3200	85.9	3900	105						
80	5.5	2600	69.7	3500	93.9	3900	105								
100	6.9	3100	83.2	3900	105	4300	115								
125	8.6	3900	105	5400	145										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 42. Type CS400 External Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
5 psig	-0.5 psi	0.5 psi	2 to 5.5 psig	GE30190X012 / Black
345 mbar	-34 mbar	34 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
10	0.69	530	14.2	710	19.0	710	19.0	710	19.0	1660	44.5	2000	54	2200	59.0
15	1.0	760	20.4	1220	32.7	1710	46	1810	48.5	2300	62	2800	75	3400	91.2
20	1.4	990	26.5	1400	37.5	1710	46	2300	61.7	2800	75	3500	94	4100	110
30	2.1	1400	37.5	1890	50.7	2400	64	2900	77.8	3900	105	4400	118		
40	2.8	1670	44.8	2300	61.7	2900	78	4000	107	4900	132				
50	3.4	1960	52.6	2900	77.8	3400	91	4600	123						
60	4.1	2400	64.4	3200	85.9	4000	107	5200	140						
80	5.5	3100	83.2	4200	113	5000	134								
100	6.9	3500	93.9	4900	132	5600	150								
125	8.6	4500	121	6700	180										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 43. Type CS400 External Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
5 psig	-1 psig	1 psig	2 to 5.5 psig	GE30190X012 / Black
345 mbar	-69 mbar	69 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4, 1-1/2 and 2															
10	0.69	670	17.9	1320	35.4	1600	42.9	1700	45.6	3000	80.5	3600	97	4200	113
15	1.0	950	25.5	1770	47.5	2700	72.4	3100	83.2	4400	118	5500	148	6300	169
20	1.4	1160	31.1	2000	53.6	2900	77.8	3700	99.3	5300	142	7000	188	8200	220
30	2.1	1570	42.1	2600	69.7	4100	110	5200	140	7700	207	9000	247		
40	2.8	1860	49.9	3300	88.5	4800	129	6700	180	9000	242				
50	3.4	2000	53.6	3900	105	5800	156	8100	217						
60	4.1	2500	67.1	4300	115	7000	188	9600	258						
80	5.5	3300	88.5	5600	150	8900	239								
100	6.9	3900	105	6600	177	10,200	274								
125	8.6	4900	132	8800	236										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 44. Types CS403 and CS404 Internal Registration Flow Capacities for 7 in. w.c. / 17 mbar Setpoint

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	Droop	Boost		
7 in. w.c.	-1 in. w.c.	2 in. w.c.	6 to 8 in. w.c.	GE30188X012 / Gold
17 mbar	-2 mbar	5 mbar	15 to 20 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
0.5	0.03	80	2.1	160	4.3	210	5.6	250	67	520	13.9	420	11.3	410	11.0
1	0.07	160	4.3	290	7.8	440	11.8	340	9.1	520	13.9	560	15.0	730	19.6
2	0.14	280	7.5	350	9.4	480	12.9	590	15.8	830	22.2	1050	28.1	1210	32.4
3	0.21	310	8.3	460	12.3	650	17.4	740	19.8	1270	34.0	1440	38.6	1790	48.0
5	0.34	420	11.3	660	17.7	960	25.7	1180	31.6	2070	55.5	2460	65.9	2730	73.2
10	0.69	720	19.3	1280	34.3	1840	49.3	2390	64.1	3640	97.6	4830	129	4850	130.0
15	1.0	970	26.0	1800	48.2	2700	72.4	3580	95.9	5130	138	3910	105	6700	180
20	1.4	1150	30.8	2170	58.2	3390	90.9	4530	121	3170	85.0	2540	68.1	3330	89.2
30	2.1	1530	41.0	2780	74.5	4450	119	2410	64.6	2260	60.6	2280	61.1		
40	2.8	1890	50.7	2800	75.0	2980	79.9	2120	56.8	2260	60.6				
50	3.4	2260	60.6	2800	75.0	2690	72.1	2080	55.7						
60	4.1	2400	64.3	2730	73.2	2590	69.4	2040	54.7						
80	5.5	2400	64.3	2590	69.4	2590	69.4								
100	6.9	2400	64.3	2590	69.4	2590	69.4								
125	8.6	2540	68.1	2590	69.4										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 Gray areas indicate limited capacities due to boost effects.

Table 45. Types CS403 and CS404 Internal Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
1 psig	-0.16 psig	0.16 psig	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-0.011 bar	0.011 bar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
psig	bar														
2	0.14	200	5.4	330	8.8	430	11.5	460	12.3	620	16.6	730	19.6	790	21.2
3	0.21	370	9.9	380	10.2	590	15.8	640	17.2	830	22.2	1000	26.8	1080	28.9
5	0.34	400	10.7	550	14.7	800	21.4	900	24.1	1180	31.6	1520	40.7	1900	50.9
10	0.69	610	16.3	880	23.6	1270	34.0	1510	40.5	2210	59.2	2790	74.8	3310	88.7
15	1.0	860	23.0	1270	34.0	1770	47.4	2140	57.4	3120	83.6	4380	117	5230	140
20	1.4	1070	28.7	1540	41.3	2260	60.6	2890	77.5	4100	110	6110	164	6820	183
30	2.1	1450	38.9	2390	64.1	3300	88.4	4250	114	7210	193	8300	222		
40	2.8	1880	50.4	3250	87.1	4460	120	6370	171	10,110	271				
50	3.4	2220	59.5	3920	105	5990	161	8150	218						
60	4.1	2630	70.5	4590	123	7470	200	9620	258						
80	5.5	3340	89.5	5980	160	8620	231								
100	6.9	3560	95.4	7230	194	8620	231								
125	8.6	3560	95.4	7610	204										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 46. Types CS403 and CS404 Internal Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
1 psig	-0.31 psig	0.31 psig	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-21 bar	21 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
psig	bar														
2	0.14	250	6.7	460	12.3	640	17.2	770	20.6	1050	28.1	1180	31.6	1460	39.1
3	0.21	420	11.3	570	15.3	840	22.5	1050	28.1	1440	38.6	1800	48.2	2020	54.1
5	0.34	530	14.2	810	21.7	1230	33.0	1500	40.2	1980	53.1	2430	65.1	2930	78.5
10	0.69	800	21.4	1320	35.4	1930	51.7	2420	64.9	3390	90.9	4250	114	4870	131
15	1.0	1030	27.6	1750	46.9	2580	69.1	3210	86.0	4720	127	5900	158	6550	176
20	1.4	1200	32.2	2120	56.8	3190	85.5	4000	107	6000	161	7390	198	8360	224
30	2.1	1560	41.8	2770	74.2	4350	117	5780	155	8730	234	10,820	290		
40	2.8	1920	51.5	3400	91.1	5520	148	7430	199	11,390	305				
50	3.4	2280	61.1	4060	109	6620	177	9150	245						
60	4.1	2650	71.0	4670	125	7760	208	10,720	287						
80	5.5	3370	90.3	5980	160	9870	265								
100	6.9	4100	110	7250	194	12,000	322								
125	8.6	4380	117	8190	220										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 47. Types CS403 and CS404 Internal Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
1 psig	-0.1 psig	0.1 psig	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-7 bar	7 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
2	0.14	180	4.8	280	7.5	480	12.9	340	9.1	430	11.5	480	12.9	570	15.3
3	0.21	330	8.8	290	7.8	640	17.2	470	12.6	600	16.1	680	18.2	810	21.7
5	0.34	310	8.3	400	10.7	900	24.1	640	17.2	830	22.2	1080	28.9	1210	32.4
10	0.69	490	13.1	640	17.2	1450	38.9	1100	29.5	1580	42.3	2190	58.7	2360	63.2
15	1.0	660	17.7	890	23.9	1970	52.8	1600	42.9	2220	59.5	3070	82.3	4190	112
20	1.4	840	22.5	1100	29.5	2460	65.9	2150	57.6	3160	84.7	5110	137	5960	160
30	2.1	1180	31.6	1810	48.5	3610	96.7	3470	93.0	6380	171	7160	192		
40	2.8	1640	44.0	2590	69.4	4800	129	4970	133	9700	260				
50	3.4	2100	56.3	3510	94.1	6260	168	7390	198						
60	4.1	2480	66.5	4370	117	7580	203	9030	242						
80	5.5	3280	87.9	5930	159	9710	260								
100	6.9	4020	108	7220	194	11,940	320								
125	8.6	3030	81.2	7030	188										

- Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 - Gray areas indicate limited capacities due to boost effects.

Table 48. Types CS403 and CS404 Internal Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
1 psig	-0.2 psig	0.2 psig	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-14 bar	14 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
2	0.14	220	5.9	370	9.9	700	18.8	560	15.0	760	20.4	840	22.5	960	25.7
3	0.21	380	10.2	450	12.1	950	25.5	740	19.8	1000	26.8	1200	32.2	1390	37.3
5	0.34	450	12.1	640	17.2	1350	36.2	1080	28.9	1460	39.1	1860	49.8	2270	60.8
10	0.69	740	19.8	1050	28.1	2100	56.3	1890	50.7	2610	69.9	3230	86.6	3850	103
15	1.0	950	25.5	1460	39.1	2750	73.7	2530	67.8	3630	97.3	4980	134	5800	155
20	1.4	1180	31.6	1860	49.8	3390	90.9	3290	88.2	4890	131	6610	177	7370	198
30	2.1	1530	41.0	2680	71.8	4470	120	4710	126	7650	205	9180	246		
40	2.8	1900	50.9	3320	89.0	5620	151	6760	181	10,380	278				
50	3.4	2250	60.3	4000	107	6680	179	8530	229						
60	4.1	2650	71.0	4650	125	7770	208	10,030	269						
80	5.5	3360	90.0	5980	160	9900	265								
100	6.9	4090	110	7230	194	12,010	322								
125	8.6	3890	104	7840	210										

- Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 - Gray areas indicate limited capacities due to boost effects.

Table 49. Types CS403 and CS404 Internal Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
2 psig	-0.17 psig	0.17 psig	1 to 2 psig	GE30190X012 / Black
138 mbar	-12 bar	12 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4													
3	0.21	250	6.7	440	11.8	520	13.9	500	13.4	680	18.2	820	22.0	900	24.1
5	0.34	360	9.6	510	13.7	690	18.5	810	21.7	1090	29.2	1310	35.1	1430	38.3
10	0.69	600	16.1	870	23.3	1110	29.7	1360	36.4	1940	52.0	2480	66.5	2930	78.5
15	1.0	790	21.2	1180	31.6	1500	40.2	1960	52.5	2900	77.7	3600	96.5	4240	114
20	1.4	990	26.5	1490	39.9	2030	54.4	2580	69.1	3680	98.6	4880	131	5690	153
30	2.1	1410	37.8	2150	57.6	3030	81.2	4120	110	6030	162	7280	195		
40	2.8	1840	49.3	2800	75.0	4590	123	5700	153	7760	208				
50	3.4	2160	57.9	3440	92.2	5920	159	7120	191						
60	4.1	2580	69.1	4210	113	7310	196	8230	221						
80	5.5	3340	89.5	5920	159	9510	255								
100	6.9	4000	107	7140	191	6810	183								
125	8.6	3440	92.2	6290	169										

- Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 - Gray areas indicate limited capacities due to boost effects.

Table 50. Types CS403 and CS404 Internal Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
2 psig	-0.33 psig	0.33 psig	1 to 2 psig	GE30190X012 / Black
138 mbar	-23 bar	23 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4													
3	0.21	320	8.6	550	14.7	770	20.6	860	23.0	1150	30.8	1440	38.6	1600	42.9
5	0.34	470	12.6	780	20.9	1090	29.2	1330	35.6	1850	49.6	2270	60.8	2610	69.9
10	0.69	790	21.2	1350	36.2	1810	48.5	2240	60.0	3270	87.6	3970	106	4640	124
15	1.0	970	26.0	1780	47.7	2160	57.9	3120	83.6	4500	121	5400	145	6290	169
20	1.4	1170	31.4	2150	57.6	3110	83.3	3990	107	5540	149	6900	185	7790	209
30	2.1	1550	41.5	2800	75.0	4380	117	5600	150	7820	210	9200	247		
40	2.8	1930	51.7	3420	91.7	5530	148	7200	193	9840	264				
50	3.4	2260	60.6	4100	110	6470	173	8570	230						
60	4.1	2650	71.0	4600	123	7710	207	9850	264						
80	5.5	3370	90.3	5960	160	9820	263								
100	6.9	4030	108	7230	194	8110	217								
125	8.6	4420	119	7670	206										

- Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 - Gray areas indicate limited capacities due to boost effects.

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Table 51. Types CS403 and CS404 Internal Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
2 psig	-0.2 psig	0.2 psig	1 to 2 psig	GE30190X012 / Black
138 mbar	-14 bar	14 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4													
3	0.21	270	7.2	460	12.3	580	15.5	570	15.3	790	21.2	970	26.0	1030	27.6
5	0.34	390	10.5	580	15.5	800	21.4	920	24.7	1250	33.5	1510	40.5	1710	45.8
10	0.69	660	17.7	1020	27.3	1280	34.3	1560	41.8	2240	60.0	2800	75.0	3290	88.2
15	1.0	860	23.0	1360	36.4	1260	33.8	2280	61.1	3380	90.6	3910	105	4730	127
20	1.4	1080	28.9	1720	46.1	2280	61.1	2940	78.8	4120	110	5480	147	6100	164
30	2.1	1440	38.6	2460	65.9	3490	93.5	4560	122	6340	170	7740	207		
40	2.8	1890	50.7	3120	83.6	4910	132	6150	165	8210	220				
50	3.4	2200	59.0	3750	101	6100	164	7460	200						
60	4.1	2590	69.4	4390	118	7430	199	8510	228						
80	5.5	3360	90.0	5930	159	9610	258								
100	6.9	4010	108	7170	192	7140	191								
125	8.6	3670	98.4	6770	181										

- Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 - Gray areas indicate limited capacities due to boost effects.

Table 52. Types CS403 and CS404 Internal Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
2 psig	-0.4 psig	0.4 psig	1 to 2 psig	GE30190X012 / Black
138 mbar	-28 bar	28 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4													
3	0.21	330	8.8	580	15.5	820	22.0	940	25.2	1320	35.4	1680	45.0	1870	50.1
5	0.34	490	13.1	850	22.8	1220	32.7	1500	40.2	2090	56.0	2590	69.4	3000	80.4
10	0.69	800	21.4	1410	37.8	1990	53.3	2510	67.3	3620	97.0	4410	118	5110	137
15	1.0	1000	26.8	1820	48.8	2450	65.7	3410	91.4	4930	132	5950	160	6960	187
20	1.4	1190	31.9	2170	58.2	3320	89.0	4290	115	6090	163	7430	199	8370	224
30	2.1	1560	41.8	2810	75.3	4530	121	5890	158	8400	225	10,060	270		
40	2.8	1930	51.7	3430	91.9	5630	151	7510	201	10,290	276				
50	3.4	2280	61.1	4100	110	6590	177	8860	237						
60	4.1	2650	71.0	4650	125	7760	208	10,240	274						
80	5.5	3370	90.3	5970	160	9880	265								
100	6.9	4040	108	7240	194	8350	224								
125	8.6	4640	124	7930	213										

- Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.
 - Gray areas indicate limited capacities due to boost effects.

Table 53. Types CS403 and CS404 Internal Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
5 psig	-0.2 psig	0.2 psig	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-14 bar	14 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4													
10	0.69	300	8.0	410	11.0	470	12.6	560	15.0	710	19.0	970	26.0	1050	28.1
15	1.0	400	10.7	570	15.3	630	16.9	820	22.0	1080	28.9	1460	39.1	1700	45.6
20	1.4	540	14.5	760	20.4	780	20.9	1050	28.1	1510	40.5	1880	50.4	2340	62.7
30	2.1	740	19.8	1040	27.9	1170	31.4	1590	42.6	2360	63.2	2920	78.3		
40	2.8	920	24.7	1240	33.2	1610	43.1	2150	57.6	3530	94.6				
50	3.4	1170	31.4	1740	46.6	2120	56.8	2800	75.0						
60	4.1	1380	37.0	1980	53.1	2710	72.6	3400	91.1						
80	5.5	1950	52.3	2950	79.1	4310	116								
100	6.9	2680	71.8	4160	112	7230	194								
125	8.6	3480	93.3	5710	153										

☐ – Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 54. Types CS403 and CS404 Internal Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
5 psig	-0.39 psig	0.39 psig	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-27 bar	27 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
		Body Size: NPS 1-1/4													
10	0.69	480	12.9	680	18.2	820	22.0	1000	26.8	1340	35.9	1810	48.5	1910	51.2
15	1.0	660	17.7	900	24.1	1060	28.4	1470	39.4	2060	55.2	2650	71.0	2940	78.8
20	1.4	860	23.0	1260	33.8	1490	39.9	1880	50.4	2750	73.7	3520	94.3	3960	106
30	2.1	1210	32.4	1800	48.2	2170	58.2	2920	78.3	4160	112	6000	161		
40	2.8	1570	42.1	2340	62.7	3020	80.9	3900	105	5820	156				
50	3.4	1930	51.7	2930	78.5	4040	108	5160	138						
60	4.1	2300	61.6	3610	96.7	5130	138	6830	183						
80	5.5	3120	83.6	4990	134	7740	207								
100	6.9	3950	106	6330	170	10,210	274								
125	8.6	4820	129	8430	226										

☐ – Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 55. Types CS403 and CS404 Internal Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
5 psig	-0.5 psig	0.5 psig	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-34 bar	34 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
10	0.69	540	14.5	790	21.2	990	26.5	1230	33.0	1690	45.3	2160	57.9	2340	62.7
15	1.0	760	20.4	1100	29.5	1420	38.1	1830	49.0	2520	67.5	3270	87.6	3550	95.1
20	1.4	960	25.7	1480	39.7	1880	50.4	2390	64.1	3360	90.0	4410	118	5050	135
30	2.1	1390	37.3	2190	58.7	2720	72.9	3600	96.5	5010	134	7110	191		
40	2.8	1790	48.0	2840	76.1	3680	98.6	4790	128	7230	194				
50	3.4	2150	57.6	3480	93.3	4840	130	6330	170						
60	4.1	2550	68.3	4170	112	6090	163	8250	221						
80	5.5	3320	89.0	5490	147	8530	229								
100	6.9	4050	109	7050	189	10,830	290								
125	8.6	4900	131	8570	230										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 56. Types CS403 and CS404 Internal Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
5 psig	-1 psig	1 psig	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-69 mbar	69 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
10	0.69	670	18.0	1140	30.6	1650	44.2	2050	54.9	2950	79.1	3800	102	4130	111
15	1.0	940	25.2	1650	44.2	2380	63.8	3010	80.7	4200	113	5560	149	6280	168
20	1.4	1170	31.4	2110	56.5	2950	79.1	3900	105	5560	149	7020	188	8270	222
30	2.1	1530	41.0	2700	72.4	4210	113	5570	149	7910	212	10,320	277		
40	2.8	1890	50.7	3360	90.0	5360	144	7260	195	10,320	277				
50	3.4	2270	60.8	4040	108	6540	175	8940	240						
60	4.1	2640	70.8	4640	124	7670	206	10,420	279						
80	5.5	3360	90.0	5930	159	9710	260								
100	6.9	4090	110	7210	193	11,650	312								
125	8.6	4960	133	8830	237										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 57. Types CS403 and CS404 External Registration Flow Capacities for 7 in. w.c. / 17 mbar Setpoint

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	Droop	Boost		
7 in. w.c.	-1 in. w.c.	2 in. w.c.	6 to 8 in. w.c.	GE30188X012 / Gold
17 mbar	-2 mbar	5 mbar	15 to 20 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
0.5	0.03	110	2.9	150	4.0	290	7.8	300	8.0	370	9.9	410	11.0	510	13.7
1	0.07	150	4.0	230	6.2	280	7.5	380	10.2	510	13.7	600	16.1	500	13.4
2	0.14	220	5.9	330	8.8	380	10.2	530	14.2	690	18.5	750	20.1	920	24.7
3	0.21	270	7.2	390	10.5	490	13.1	490	13.1	870	23.3	1060	28.4	1140	30.6
5	0.34	340	9.1	570	15.3	460	12.3	440	11.8	1110	29.7	1440	38.6	1440	38.6
10	0.69	480	12.9	370	9.9	910	24.4	1350	36.2	1610	43.1	1980	53.1	2040	54.7
15	1.0	340	9.1	540	14.5	1190	31.9	1500	40.2	1940	52.0	2640	70.8	2320	62.2
20	1.4	480	12.9	1160	31.1	1500	40.2	1830	49.0	2360	63.2	3700	99.2	3380	90.6
30	2.1	1110	29.7	1590	42.6	1860	49.8	2350	63.0	2340	62.7	6510	175		
40	2.8	1300	34.8	1810	48.5	2320	62.2	2850	76.4	4590	123				
50	3.4	1540	41.3	2420	64.9	3160	84.7	3410	91.4						
60	4.1	1800	48.2	2870	76.9	3970	106	3840	103						
80	5.5	2320	62.2	4320	116	5750	154								
100	6.9	3230	86.6	5940	159	5750	154								
125	8.6	4310	116	7520	202										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 58. Types CS403 and CS404 External Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
1 psig	-0.16 psig	-0.16 psig	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-0.011 bar	0.011 bar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
2	0.1	240	6.4	330	8.8	370	9.9	490	13.1	690	18.5	850	22.8	1160	31.1
3	0.2	320	8.6	420	11.3	490	13.1	280	7.5	370	9.9	1040	27.9	1130	30.3
5	0.3	400	10.7	540	14.5	440	11.8	790	21.2	1080	28.9	1420	38.1	1550	41.5
10	0.69	390	10.5	390	10.5	990	26.5	1250	33.5	1670	44.8	2040	54.7	2340	62.7
15	1.0	370	9.9	1060	28.4	1320	35.4	1610	43.1	2150	57.6	2800	75.0	3010	80.7
20	1.4	920	24.7	1340	35.9	1610	43.1	1860	49.8	2410	64.6	3190	85.5	3540	94.9
30	2.1	1240	33.2	1680	45.0	2020	54.1	2480	66.5	3280	87.9	4240	114		
40	2.8	1500	40.2	2090	56.0	2430	65.1	3020	80.9	4170	112				
50	3.4	1820	48.8	2470	66.2	2770	74.2	3800	102						
60	4.1	2090	56.0	2950	79.1	3530	94.6	4090	110						
80	5.5	2630	70.5	3410	91.4	3530	94.6								
100	6.9	3340	89.5	4030	108	4420	119								
125	8.6	3860	103	5010	134										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 59. Types CS403 and CS404 External Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
1 psig	-0.31 psig	0.31 psig	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-21 mbar	21 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
2	0.14	310	8.3	480	12.9	600	16.1	790	21.2	1530	41.0	1750	46.9	1760	47.2
3	0.21	400	10.7	620	16.6	830	22.2	750	20.1	1380	37.0	1690	45.3	2060	55.2
5	0.34	540	14.5	840	22.5	990	26.5	1400	37.5	1930	51.7	2500	67.0	2850	76.4
10	0.69	710	19.0	820	22.0	1740	46.6	2190	58.7	3050	81.7	3760	101	4470	120
15	1.0	760	20.4	1680	45.0	2350	63.0	2870	76.9	3940	106	5140	138	5700	153
20	1.4	1180	31.6	2030	54.4	2770	74.2	3440	92.2	4740	127	6120	164	7140	191
30	2.1	1550	41.5	2690	72.1	3660	98.1	4560	122	6540	175	8890	238		
40	2.8	1910	51.2	3340	89.5	4620	124	5790	155	8400	225				
50	3.4	2270	60.8	3930	105	5490	147	7060	189						
60	4.1	2620	70.2	4710	126	6560	176	8470	227						
80	5.5	3350	89.8	5740	154	8310	223								
100	6.9	4070	109	7060	189	8660	232								
125	8.6	4950	133	8540	229										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 60. Types CS403 and CS404 External Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
1 psig	-0.1 psig	0.1 psig	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-7 mbar	7 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
2	0.1	200	5.4	250	6.7	290	7.8	370	9.9	500	13.4	580	15.5	880	23.6
3	0.2	260	7.0	310	8.3	350	9.4	170	4.6	340	9.1	690	18.5	790	21.2
5	0.3	310	8.3	400	10.7	260	7.0	590	15.8	760	20.4	930	24.9	1040	27.9
10	0.69	240	6.4	380	10.2	690	18.5	880	23.6	1140	30.6	1300	34.8	1580	42.3
15	1.0	360	9.6	790	21.2	940	25.2	1100	29.5	1400	37.5	1690	45.3	2110	56.5
20	1.4	540	14.5	950	25.5	1080	28.9	1200	32.2	1560	41.8	1880	50.4	2400	64.3
30	2.1	920	24.7	1170	31.4	1320	35.4	1330	35.6	1840	49.3	2610	69.9		
40	2.8	980	26.3	1500	40.2	1500	40.2	1680	45.0	2260	60.6				
50	3.4	1320	35.4	1710	45.8	1650	44.2	1990	53.3						
60	4.1	1370	36.7	1980	53.1	1990	53.3	1990	53.3						
80	5.5	1650	44.2	1870	50.1	1990	53.3								
100	6.9	2070	55.5	2220	59.5	2440	65.4								
125	8.6	2360	63.2	2690	72.1										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 61. Types CS403 and CS404 External Registration Flow Capacities for 1 psig / 69 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
1 psig	-0.2 psig	0.2 psig	18 in. w.c. to 1 psig	GE30225X012 / Orange
69 mbar	-14 mbar	14 mbar	45 to 69 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
2	0.14	260	7.0	390	10.5	450	12.1	590	15.8	840	22.5	990	26.5	1280	34.3
3	0.21	350	9.4	490	13.1	610	16.3	440	11.8	620	16.6	1210	32.4	1400	37.5
5	0.34	450	12.1	640	17.2	600	16.1	960	25.7	1370	36.7	1770	47.4	1940	52.0
10	0.69	500	13.4	450	12.1	1220	32.7	1550	41.5	2170	58.2	2580	69.1	2900	77.7
15	1.0	400	10.7	1320	35.4	1630	43.7	2020	54.1	2660	71.3	3500	93.8	3900	105
20	1.4	1050	28.1	1590	42.6	1970	52.8	2360	63.2	3180	85.2	4220	113	4940	132
30	2.1	1420	38.1	2100	56.3	2540	68.1	3100	83.1	4320	116	5750	154		
40	2.8	1770	47.4	2570	68.9	3210	86.0	3930	105	5620	151				
50	3.4	2150	57.6	3090	82.8	3640	97.6	4860	130						
60	4.1	2420	64.9	3700	99.2	4560	122	5520	148						
80	5.5	3140	84.2	4320	116	5380	144								
100	6.9	3810	102	5460	146	6430	172								
125	8.6	4660	125	6820	183										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 62. Types CS403 and CS404 External Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
2 psig	-0.17 psi	0.17 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-12 mbar	12 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
3	0.21	240	6.4	340	9.1	410	11.0	540	14.5	550	14.7	770	20.6	1270	34.0
5	0.34	350	9.4	520	13.9	620	16.6	350	9.4	990	26.5	1270	34.0	1340	35.9
10	0.69	500	13.4	410	11.0	980	26.3	1210	32.4	1640	44.0	2110	56.5	2350	63.0
15	1.0	340	9.1	890	23.9	1330	35.6	1650	44.2	2160	57.9	2660	71.3	3040	81.5
20	1.4	450	12.1	1310	35.1	1650	44.2	1940	52.0	2580	69.1	3310	88.7	3750	101
30	2.1	1260	33.8	1700	45.6	2200	59.0	2530	67.8	3340	89.5	4230	113		
40	2.8	1510	40.5	2110	56.5	2630	70.5	3000	80.4	3950	106				
50	3.4	1880	50.4	2510	67.3	3120	83.6	3530	94.6						
60	4.1	2130	57.1	2700	72.4	3490	93.5	3530	94.6						
80	5.5	2700	72.4	3770	101	4350	117								
100	6.9	2990	80.1	4140	111	5280	142								
125	8.6	3630	97.3	5130	138										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

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Table 63. Types CS403 and CS404 External Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
2 psig	-0.33 psig	0.33 psig	1 to 2 psig	GE30190X012 / Black
138 mbar	-23 mbar	23 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
3	0.21	320	8.6	520	13.9	690	18.5	910	24.4	1120	30.0	1530	41.0	1900	50.9
5	0.34	470	12.6	770	20.6	1080	28.9	1380	37.0	1800	48.2	2280	61.1	2430	65.1
10	0.69	750	20.1	1270	34.0	1710	45.8	2210	59.2	2920	78.3	3820	102	4220	113
15	1.0	830	22.2	1680	45.0	2370	63.5	2950	79.1	3910	105	5020	135	5750	154
20	1.4	1180	31.6	2090	56.0	2860	76.6	3650	97.8	4970	133	6120	164	7020	188
30	2.1	1550	41.5	2740	73.4	3810	102	4800	129	6800	182	8780	235		
40	2.8	1900	50.9	3360	90.0	4720	127	5970	160	8410	225				
50	3.4	2250	60.3	4010	108	5670	152	7170	192						
60	4.1	2650	71.0	4590	123	6750	181	8140	218						
80	5.5	3330	89.2	5910	158	8550	229								
100	6.9	4060	109	7100	190	10,990	295								
125	8.6	4920	132	8580	230										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 64. Types CS403 and CS404 External Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
2 psig	-0.2 psig	0.2 psig	1 to 2 psig	GE30190X012 / Black
138 mbar	-14 mbar	14 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
3	0.21	260	7.0	380	10.2	460	12.3	630	16.9	640	17.2	880	23.6	1400	37.5
5	0.34	400	10.7	580	15.5	720	19.3	520	13.9	1150	30.8	1480	39.7	1620	43.4
10	0.69	570	15.3	460	12.3	1180	31.6	1500	40.2	1910	51.2	2490	66.7	2780	74.5
15	1.0	390	10.5	1240	33.2	1610	43.1	1970	52.8	2610	69.9	3340	89.5	3600	96.5
20	1.4	470	12.6	1540	41.3	1950	52.3	2360	63.2	3110	83.3	3960	106	4490	120
30	2.1	1400	37.5	2010	53.9	2610	69.9	3030	81.2	4120	110	5350	143		
40	2.8	1730	46.4	2470	66.2	3280	87.9	3670	98.4	5070	136				
50	3.4	2040	54.7	2930	78.5	3740	100	4370	117						
60	4.1	2400	64.3	3270	87.6	4420	119	4870	131						
80	5.5	3050	81.7	4450	119.3	5520	148								
100	6.9	3600	96.5	5150	138.0	6970	187								
125	8.6	4310	116	6140	164.6										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 65. Types CS403 and CS404 External Registration Flow Capacities for 2 psig / 138 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
2 psig	-0.4 psig	0.4 psig	1 to 2 psig	GE30190X012 / Black
138 mbar	-28 mbar	28 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
3	0.21	340	9.1	570	15.3	760	20.4	1020	27.3	1310	35.1	1630	43.7	2110	56.5
5	0.34	490	13.1	830	22.2	1170	31.4	1550	41.5	2020	54.1	2560	68.6	2830	75.8
10	0.69	780	20.9	1320	35.4	1940	52.0	2590	69.4	3470	93.0	4350	117	4920	132
15	1.0	910	24.4	1770	47.4	2630	70.5	3350	89.8	4640	124	5770	155	6880	184
20	1.4	1190	31.9	2160	57.9	3200	85.8	4110	110	5560	149	7270	195	8180	219
30	2.1	1560	41.8	2800	75.0	4260	114	5530	148	7790	209	10,190	273		
40	2.8	1930	51.7	3460	92.7	5280	142	6950	186	9610	258				
50	3.4	2280	61.1	4080	109	6300	169	8250	221						
60	4.1	2650	71.0	4730	127	7320	196	9570	257						
80	5.5	3360	90.0	5990	161	9340	250								
100	6.9	4090	110	7220	194	11,680	313								
125	8.6	4980	134	8870	238										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 66. Types CS403 and CS404 External Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 1% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
5 psig	-0.2 psig	0.2 psig	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-14 mbar	14 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
10	0.69	330	8.8	460	12.3	120	3.2	500	13.4	750	20.1	860	23.0	960	25.7
15	1.0	420	11.3	450	12.1	610	16.3	830	22.2	1000	26.8	1250	33.5	1320	35.4
20	1.4	110	2.9	590	15.8	850	22.8	940	25.2	1270	34.0	1550	41.5	1650	44.2
30	2.1	710	19.0	900	24.1	1120	30.0	1330	35.6	1590	42.6	1830	49.0		
40	2.8	880	23.6	1100	29.5	1350	36.2	1530	41.0	2040	54.7				
50	3.4	1010	27.1	1340	35.9	1640	44.0	1780	47.7						
60	4.1	1060	28.4	1470	39.4	1780	47.7	1780	47.7						
80	5.5	1400	37.5	1690	45.3	1860	49.8								
100	6.9	1740	46.6	2250	60.3	2010	53.9								
125	8.6	1920	51.5	2420	64.9										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

CS400 Series

Table 67. Types CS403 and CS404 External Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 2% ABS Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 2% ABS			
5 psig	-0.39 psig	0.39 psig	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-27 mbar	27 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
10	0.69	490	13.1	690	18.5	350	9.4	990	26.5	1300	34.8	1620	43.4	1810	48.5
15	1.0	670	18.0	480	12.9	1090	29.2	1390	37.3	1830	49.0	2450	65.7	2580	69.1
20	1.4	390	10.5	780	20.9	1430	38.3	1820	48.8	2310	61.9	2950	79.1	3270	87.6
30	2.1	1200	32.2	1610	43.1	2000	53.6	2510	67.3	3220	86.3	4030	108		
40	2.8	1480	39.7	2010	53.9	2410	64.6	3130	83.9	4030	108				
50	3.4	1750	46.9	2500	67.0	2970	79.6	3760	101						
60	4.1	2010	53.9	2750	73.7	3400	91.1	4130	111						
80	5.5	2580	69.1	3570	95.7	4080	109								
100	6.9	3110	83.3	4500	121	4910	132								
125	8.6	3830	103	5240	140										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 68. Types CS403 and CS404 External Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 10% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 10%			
5 psig	-0.5 psig	0.5 psig	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-34 mbar	34 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
10	0.69	550	14.7	820	22.0	570	15.3	1250	33.5	1670	44.8	2060	55.2	2340	62.7
15	1.0	770	20.6	510	13.7	1430	38.3	1700	45.6	2280	61.1	3000	80.4	3270	87.6
20	1.4	540	14.5	930	24.9	1790	48.0	2180	58.4	2980	79.9	3720	99.7	4060	109
30	2.1	1370	36.7	1850	49.6	2470	66.2	3020	80.9	3990	107	5230	140		
40	2.8	1670	44.8	2480	66.5	3050	81.7	3890	104	5090	136				
50	3.4	2050	54.9	3030	81.2	3840	103	4620	124						
60	4.1	2380	63.8	3310	88.7	4330	116	5200	139						
80	5.5	3020	80.9	4340	116	5250	141								
100	6.9	3680	98.6	5540	149	6490	174								
125	8.6	4530	121	6420	172										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 69. Types CS403 and CS404 External Registration Flow Capacities for 5 psig / 345 mbar Setpoint at 20% Accuracy

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 20%			
5 psig	-1 psig	1 psig	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-69 mbar	69 mbar	138 to 380 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS															
Inlet Pressure		Orifice Size, In. / mm													
		3/16	4.8	1/4	6.4	5/16	7.9	3/8	9.5	1/2	13	5/8	16	3/4	19
psig	bar	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
Body Size: NPS 1-1/4															
10	0.69	700	18.8	1160	31.1	1600	42.9	2150	57.6	2940	78.8	3680	98.6	4150	111
15	1.0	950	25.5	1580	42.3	2340	62.7	2980	79.9	4170	112	5350	143	5960	160
20	1.4	1120	30.0	1990	53.3	3000	80.4	3680	98.6	5190	139	6640	178	7490	201
30	2.1	1520	40.7	2690	72.1	4080	109	5200	139	7290	195	9390	252		
40	2.8	1870	50.1	3330	89.2	5140	138	6620	177	9180	246				
50	3.4	2230	59.8	4020	108	6250	168	7840	210						
60	4.1	2610	69.9	4550	122	7160	192	9190	246						
80	5.5	3320	89.0	5740	154	9320	250								
100	6.9	4060	109	7230	194	11,310	303								
125	8.6	4920	132	8710	233										

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

Table 70. CS400 Series Internal Registration Flow Capacities for 2 psig / 138 mbar Setpoint with 1% Pressure Factor Accuracy (PFM Approved)

SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
2 psig	-0.17 psi	0.17 psi	1 to 2 psig	GE30190X012 / Black
138 mbar	-12 mbar	12 mbar	69 to 138 mbar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY GAS											
Inlet Pressure		Orifice Size, In. / mm									
		3/16	4.8	1/4	6.4	3/8	9.5	1/2	13	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4									
3	0.21	120	3.2	180	4.8	200	5.4	310	8.3	540	14.5
5	0.34	170	4.6	310	8.3	460	12.3	760	20.4	1000	26.8
10	0.69	410	11.0	650	17.4	1000	26.8	1600	42.9	2800	75.0
15	1.0	630	16.9	940	25.2	1700	45.6	2800	75.0	4600	123
20	1.4	790	21.2	1300	34.8	2600	69.7	4100	109	8675	232
25	1.7	1000	26.8	1800	48.2	3900	104	5400	144		
30	2.1	1200	32.2	2200	59.0	4000	107	6500	174		
40	2.8	1650	44.2	3100	83.1	5200	139	9500	254		
50	3.4	2000	53.6	3750	100	5200	139				
60	4.1	2400	64.3	4500	120	5200	139				
80	5.5	3200	85.8	5900	158						
100	6.9	3900	104	7200	192						
125	8.6	4900	131	7600	203						
psig	bar	Body Size: NPS 1-1/2									
3	0.21	110	2.9	170	4.6	330	8.8	470	12.6	750	20.1
5	0.34	180	4.8	290	7.8	660	17.7	1000	26.8	1400	37.5
10	0.69	390	10.5	590	15.8	1300	34.8	1975	52.9	3100	83.1
15	1.0	580	15.5	940	25.2	2025	54.3	2875	77.1	4950	132
20	1.4	760	20.4	1200	32.2	2600	69.7	3775	101	7800	208
25	1.7	980	26.3	1700	45.6	3600	96.5	5300	141		
30	2.1	1200	32.2	2100	56.3	3600	96.5	5300	141		
40	2.8	1675	44.9	2900	77.7	4850	129	9700	259		
50	3.4	2075	55.6	3700	99.2	6400	171				
60	4.1	2350	63.0	4300	115	7800	208				
80	5.5	3150	84.4	5400	144						
100	6.9	3750	100	6700	179						
125	8.6	4850	129	8050	215						
psig	bar	Body Size: NPS 2									
3	0.21	100	2.7	190	5.1	230	6.2	430	11.5	590	15.8
5	0.34	240	6.4	370	9.9	420	11.3	860	23.0	1300	34.8
10	0.69	440	11.8	700	18.8	970	26.0	1800	48.2	3000	80.4
15	1.0	660	17.7	1000	26.8	1600	42.9	2800	75.0	4200	112
20	1.4	850	22.8	1200	32.2	2400	64.3	3750	100	6900	184
25	1.7	1000	26.8	1700	45.6	3100	83.1	5300	141		
30	2.1	1200	32.2	2125	57.0	3625	97.2	5350	143		
40	2.8	1600	42.9	2925	78.4	4875	130	9700	259		
50	3.4	2000	53.6	3725	99.8	6400	171				
60	4.1	2350	63.0	4300	115	7800	208				
80	5.5	3150	84.4	5425	145						
100	6.9	3750	100	6725	180						
125	8.6	4800	128	8050	215						

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.

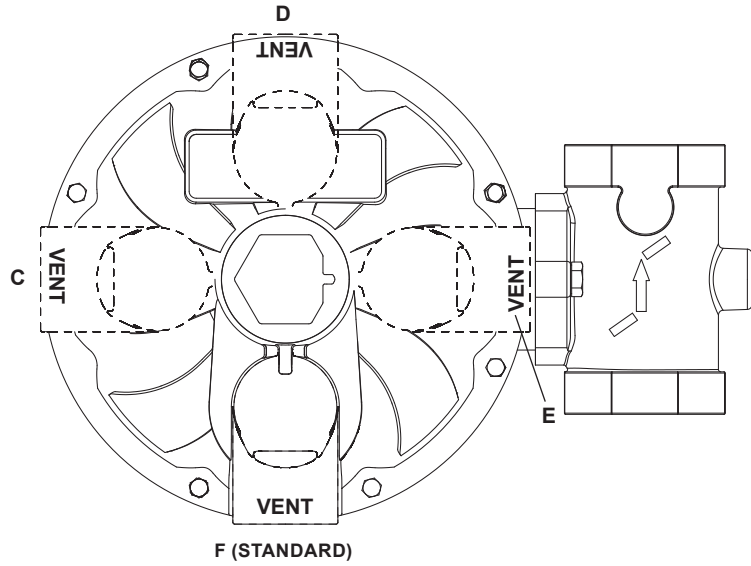
CS400 Series

Table 71. CS400 Series Internal Registration Flow Capacities for 5 psig / 345 mbar Setpoint with 1% Pressure Factor Accuracy (PFM Approved)

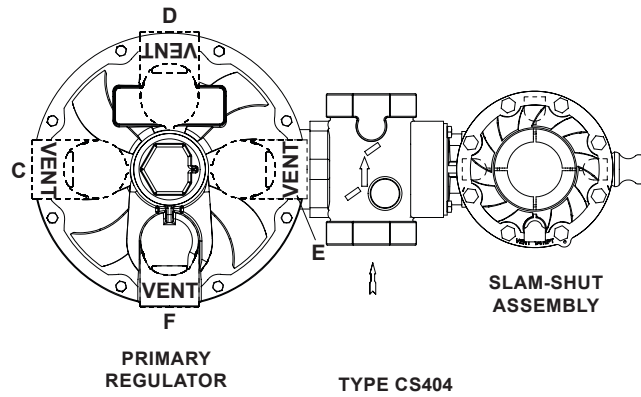
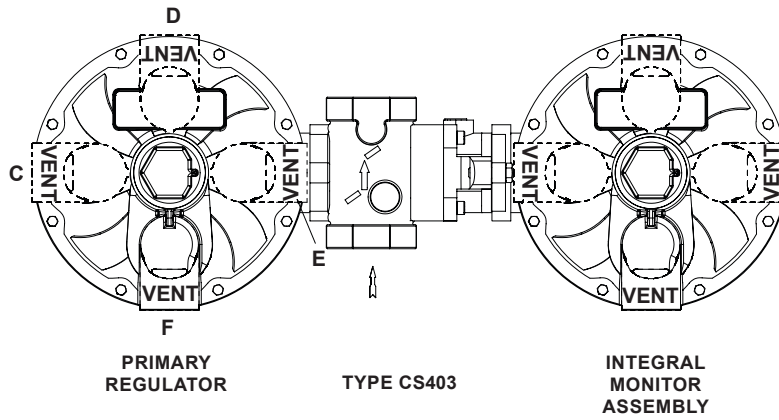
SETPOINT	ACCURACY		SET RANGE	PART NUMBER / COLOR
	+ / - 1% ABS			
5 psig	-0.20 psi	0.20 psi	2 to 5.5 psig	GE30197X012 / Yellow
345 mbar	-14 mbar	14 mbar	138 to 380 bar	

CAPACITIES IN SCFH / Nm ³ /h OF 0.6 SPECIFIC GRAVITY GAS											
Inlet Pressure		Orifice Size, In. / mm									
		3/16	4.8	1/4	6.4	3/8	9.5	1/2	13	3/4	19
		SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h	SCFH	Nm ³ /h
psig	bar	Body Size: NPS 1-1/4									
10	0.69	90	2.4	100	2.7	410	11.0	550	14.7	1100	29.5
15	1.0	160	4.3	190	5.1	780	20.9	980	26.3	1700	45.6
20	1.4	190	5.1	280	7.5	1100	29.5	1300	34.8	2175	58.3
25	1.7	250	6.7	370	9.9	1500	40.2	1900	50.9		
30	2.1	310	8.3	850	22.8	1750	46.9	2150	57.6		
40	2.8	540	14.5	1375	36.9	2250	60.3	2950	79.1		
50	3.4	1100	29.5	1600	42.9	2700	72.4				
60	4.1	1500	40.2	2200	59.0	3750	100				
80	5.5	1975	52.9	2950	79.1						
100	6.9	2725	73.0	4400	117						
125	8.6	3525	94.5	5575	149						
psig	bar	Body Size: NPS 1-1/2									
10	0.69	190	5.1	230	6.2	350	9.4	590	15.8	1000	26.8
15	1.0	300	8.0	430	11.5	750	20.1	980	26.3	1800	48.2
20	1.4	420	11.3	590	15.8	1000	26.8	1300	34.8	2000	53.6
25	1.7	490	13.1	740	19.8	1100	29.5	1800	48.2		
30	2.1	660	17.7	970	26.0	1500	40.2	2050	54.9		
40	2.8	840	22.5	1200	32.2	1725	46.2	2600	69.7		
50	3.4	1100	29.5	1425	38.2	2425	65.0				
60	4.1	1400	37.5	1725	46.2	2750	73.7				
80	5.5	2200	59.0	2450	65.7						
100	6.9	2600	69.7	3450	92.5						
125	8.6	3250	87.1	5900	158						
psig	bar	Body Size: NPS 2									
10	0.69	110	2.9	140	3.8	220	5.9	800	21.4	1000	26.8
15	1.0	180	4.8	260	7.0	710	19.0	1100	29.5	1800	48.2
20	1.4	260	7.0	350	9.4	1000	26.8	1700	45.6	2900	77.7
25	1.7	360	9.6	490	13.1	1300	34.8	2050	54.9		
30	2.1	530	14.2	790	21.2	1500	40.2	2050	54.9		
40	2.8	870	23.3	990	26.5	1725	46.2	2600	69.7		
50	3.4	1200	32.2	1300	34.8	2425	65.0				
60	4.1	1475	39.5	1725	46.2	2750	73.7				
80	5.5	2300	61.6	2450	65.7						
100	6.9	2600	69.7	3450	92.5						
125	8.6	3250	87.1	5700	152						

Blank areas indicate where maximum operating inlet pressure for a given orifice size is exceeded.



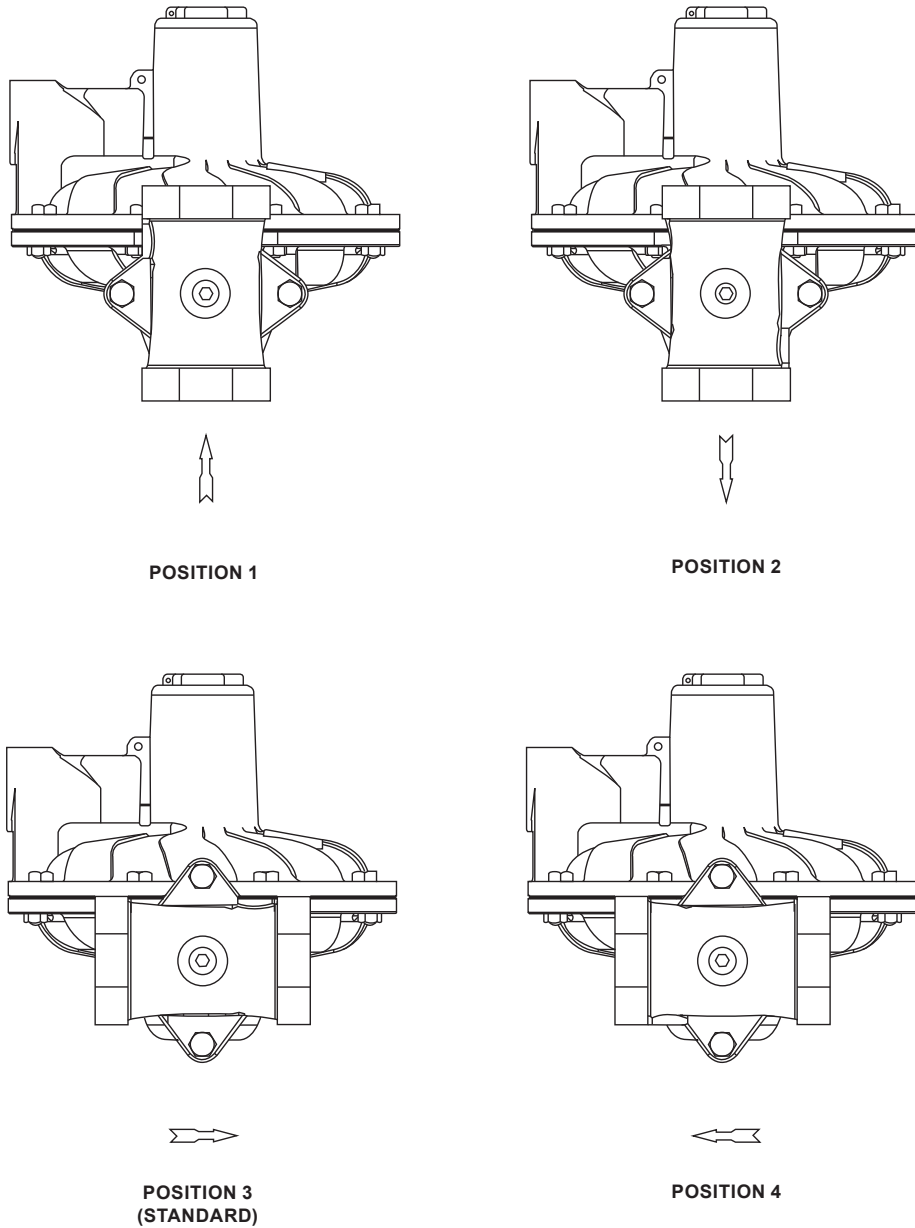
TYPE CS400



CHOOSE VENT AND BODY POSITION FOR THE TYPES CS403 AND CS404 IN THE SAME MANNER AS FOR THE BASE TYPE CS400 REGULATOR. THE VENT OF THE INTEGRAL MONITOR OR SLAM SHUT WILL BE ORIENTED IN THE SAME DIRECTION AS THE PRIMARY REGULATOR. BODY POSITION WILL ALSO BE BASED ON PRIMARY REGULATOR AS THE SPRING BARREL OF THE INTEGRAL MONITOR OR SLAM SHUT WILL POINT THE SAME DIRECTION AS THE PRIMARY REGULATOR.

Figure 15. Spring Case Vent Orientation

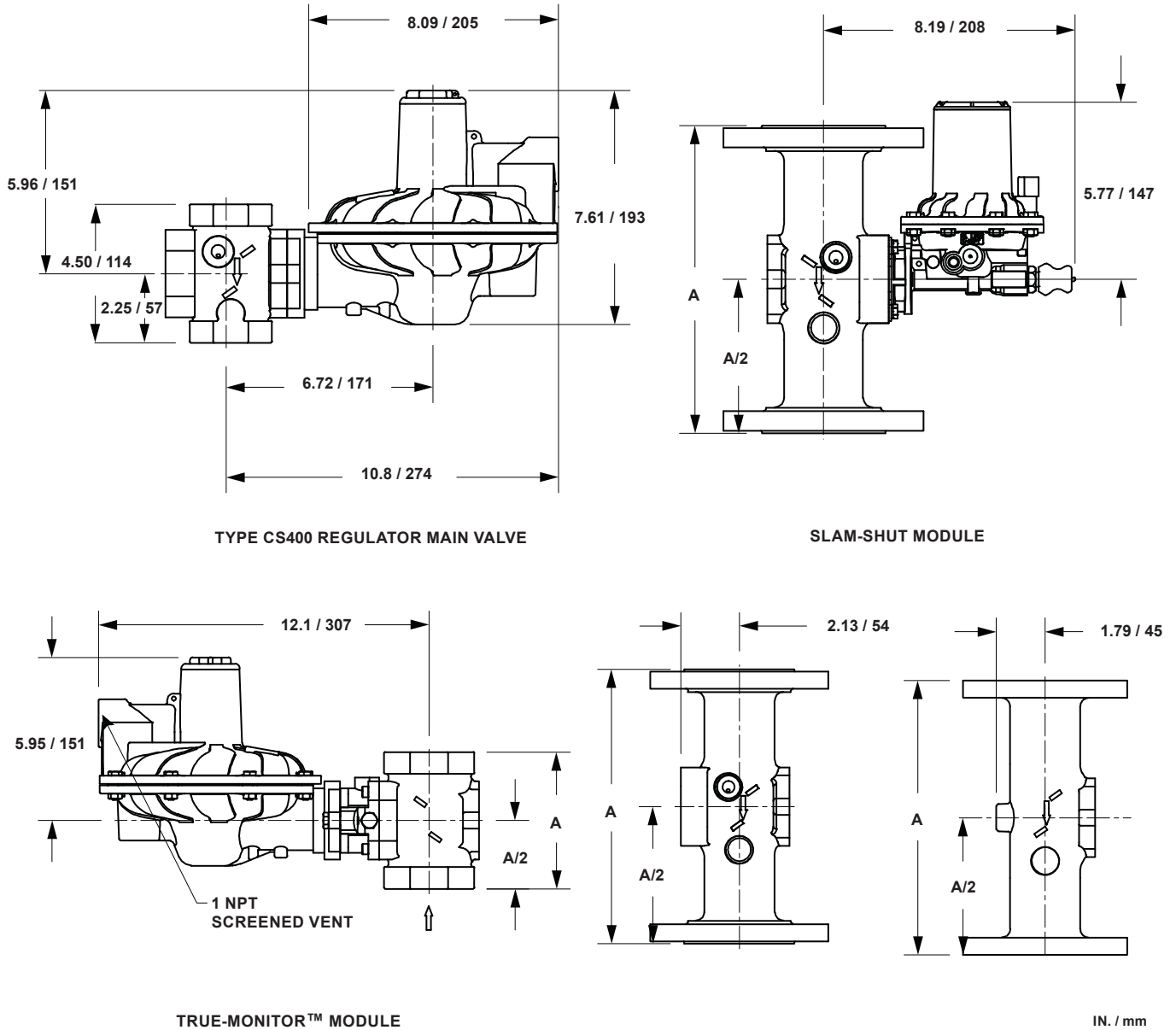
CS400 Series



GE26479-A_S6

CHOOSE VENT AND BODY POSITION FOR THE TYPES CS403 AND CS404 IN THE SAME MANNER AS FOR THE BASE TYPE CS400 REGULATOR. THE VENT OF THE INTEGRAL MONITOR OR SLAM SHUT WILL BE ORIENTED IN THE SAME DIRECTION AS THE PRIMARY REGULATOR. BODY POSITION WILL ALSO BE BASED ON PRIMARY REGULATOR AS THE SPRING BARREL OF THE INTEGRAL MONITOR OR SLAM SHUT WILL POINT THE SAME DIRECTION AS THE PRIMARY REGULATOR.

Figure 16. Body Orientation



GE34266

Figure 17. Dimensions

Table 72. Dimensions

BODY SIZE	END CONNECTION STYLES					
	A					
	NPT / Rp		CL125 FF/CL150 FF		PN 16	
	in.	mm	in.	mm	in.	mm
1-1/4	4.49	114	----		----	
1-1/2						
1	3.94	100	----		----	
2	5	127	----		----	
NPS 2 / DN 50	----		10	254	10	254

CS400 Series

Ordering Guide

Type (See Figure 3 for Construction Features)

(Select One)

Stand-Alone Regulator

- CS400IN
- CS400IR
- CS400IT
- CS400EN
- CS400ET

With Integral True-Monitor™ Module

- CS403IN
- CS403IT
- CS403EN
- CS403ET

With Type VSX4 Slam-shut Module

- CS404IN
- CS404IR
- CS404IT
- CS404EN
- CS404ET

Body Size, Material and End Connection (Select One)

Cast Iron (Type CS400 Only)

- 1-1/4 NPT***
- 1-1/4 x 1-1/2 NPT***
- 1-1/2 NPT***
- 2 NPT***
- NPS 2 / DN 50, CL125 FF***

Ductile Iron (All Types)

- 1-1/4 NPT***
- 1-1/2 NPT***
- 2 NPT***
- Rp 1-1/4***
- Rp 1-1/2***
- Rp 2***
- NPS 2, CL125 FF/CL150 FF***
- DN 50, PN 10/16***

Steel (All Types)

- 1-1/4 NPT***
- 1-1/2 NPT***
- Rp 1-1/4***
- Rp 1-1/2***

Outlet Pressure Range (Select One)

- 3.5 to 5 in. w.c. / 9 to 12 mbar, Red
- 4.5 to 6.5 in. w.c. / 11 to 16 mbar, Purple
- 6 to 8 in. w.c. / 15 to 20 mbar, Gold
- 7.5 to 11 in. w.c. / 19 to 27 mbar, Blue
- 10 to 14 in. w.c. / 25 to 35 mbar, Unpainted
- 12 to 19 in. w.c. / 30 to 47 mbar, Green
- 18 to 28 in. w.c. / 45 to 69 mbar, Orange
- 1 to 2 psig / 69 to 138 mbar, Black
- 2 to 5.5 psig / 138 to 380 mbar, Yellow

Orifice Size (Select One)

- 3/16 in. / 4.8 mm
- 7/32 in. x 1/4 in. / 5.5 x 6.4 mm
- 1/4 in. / 6.4 mm
- 5/16 in. / 7.9 mm
- 3/8 in. / 9.5 mm
- 1/2 in. / 13 mm
- 5/8 in. / 16 mm
- 3/4 in. / 19 mm

Body Orientation (Select One)

- Position 1***
- Position 2***
- Position 3 (standard)***
- Position 4***

Vent Orientation (Select One)

- Position C***
- Position D***
- Position E***
- Position F (standard)***

- continued -

Ordering Guide (continued)

Regulators Quick Order Guide	
***	Readily Available for Shipment
**	Allow Additional Time for Shipment
*	Special Order, Constructed from Non-Stocked Parts. Consult your local Sales Office for Availability.
Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction.	

Specification Worksheet
<p>Application: Specific Use _____ Line Size _____ Gas Type and Specific Gravity _____ Gas Temperature _____ Does the Application Require Overpressure Protection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, which is preferred: <input type="checkbox"/> Relief Valve <input type="checkbox"/> Monitor Regulator <input type="checkbox"/> Shut-off Device Is overpressure protection equipment selection assistance desired? _____</p>
<p>Pressure: Maximum Inlet Pressure (P_{1max}) _____ Minimum Inlet Pressure (P_{1min}) _____ Downstream Pressure Setting(s) (P_2) _____ Maximum Flow (Q_{max}) _____</p>
<p>Performance Required: Accuracy Requirements? _____ Need for Fast Response? _____</p>
<p>Other Requirements: _____ _____ _____</p>

CS400 Series

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